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Public works management role and structure : activity and staff civil engineers in the public works center

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PUBLIC WORKS MANAGEMENT ROLE AND STRUCTURE: ACTIVITY AND STAFF CIVIL ENGINEERS IN THE PUBLIC WORKS CENTER

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THESIS

PUBLIC WORKS MANAGEMENT
ROLE AND STRUCTURE:

ACTIVITY AND STAFF CIVIL ENGINEERS
IN THE
PUBLIC WORKS CENTER

by

Don Carroll Crumbley
and
Robert Edward Gagen

June 1976

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I. INTRODUCTION

Public Works management in the Navy has undergone significant policy and organizational changes in the post World War II period. Three of the more noteworthy are: establishment of centralized Public Works Center public works support, institution of a single-executive for facilities management and changes resulting from the command-support relationship of the unilinear Navy.

The changes which have occurred have resulted in some unforseen consequences for Public Works Centers (PWCs), Activity Civil Engineers (ACEs) and Staff Civil Engineers (SCEs). ACEs are receiving conflicting signals from policy statements which define their role and the actual role which they have assumed. The conflict which ACEs perceive has resulted in frustration and dissatisfaction with ACE billets. This dissatisfaction is alleged to cause a disproportionate number of CEC junior officers to forsake the Navy as a career.

Our research is directed at determining: (1) what roles an ACE and SCE have assumed in public works management, (2) the causes for the dissatisfaction with the job, (3) what the role of an ACE and SCE should be, and (4) suggested policy changes to improve the job.

II. BACKGROUND

In order to set a background for our research, it is important that we give a short review to provide a functional understanding of ACEs, SCEs and PWCs.

What An ACE Does

An ACE is normally assigned to a specific group of customer commands for which he is the primary representative within a PWC. He functions much like an advertizing account executive. He looks after the public works needs of his customer commands, insuring that PWC satisfies them and itself. He insures that a PWC understands the needs of his customers while his customers are aware of both PWC capabilities and limitations.

In doing his job, an ACE becomes involved in all facets of PWC operations: initial determination of customers' requirements, engineering design, job planning, cost estimating, work scheduling, job accomplishment, final approval and acceptance of the services provided. In addition, he may become involved in facilities matters internal to operations of his customers which are related to public works management. At his best, he may participate in the decision making process as an integral part of the organization, or act as a public works consultant. At his worst, he may be viewed as an outsider by his customer and do nothing more than take orders for work to be accomplished by PWC.

What A SCE Does

By comparison, a SCE is assigned to a major customer for primary duty and normally has only additional duty to a PWC. Although he provides liaison between his command and PWC, he is primarily responsible to his command for providing total public works management. He plans, programs and manages facilities programs and resources to meet a command's mission and requirements with the approval of his commanding officer.

In carrying out his responsibilities, a SCE becomes more involved in the operations of his command than he does PWC's command. Being an integral part of his own command, he is sometimes viewed as an outsider by PWC personnel. However, a SCE sometimes works with the same degree of detail with PWC personnel as do ACEs and interacts with all levels of a PWC organization.

ACEs and SCEs are both involved in public works matters at PWC customer commands, and form a primary communication link between a PWC and commands it supports. They operate at the boundaries of a PWC and its customer commands.

What A PWC Organization Does

Navy Public Works Centers are, as the name implies, organizations which provide public works services i.e. facilities maintenance, utilities, and transportation services to military commands within the geographical area where PWCs are located.

Facilities maintenance services typically include maintenance, repair, and alteration of buildings and other structures

such as piers and wharves; maintenance and repair of roads, airfields pavements, and grounds; trash and garbage disposal; janitorial services for buildings; and street sweeping.

Utilities services include distribution, and in some cases generation of electricity, gas, water, steam, and compressed air.

Transportation services provide vehicles to satisfy all support requirements, including passenger sedans, trucks, buses, railroad services, crane services, security and medical vehicles. Maintenance as well as repair services are also provided for these vehicles.

A PWC is a service organization which provides public works support at the request of customer Commands. It is run as a non-profit organization under Department of Defense (DOD) regulations that govern operations of defense capital working funds, specifically the Navy Industrial Fund (NIF).

Accordingly, price structures are developed for services provided by a PWC which reflect its total costs. Operating costs of a PWC are recovered by charging customer Commands for services provided at an appropriate price. Prices are developed using direct labor and material, indirect, and overhead costs in a similar manner as that used in private business except that profit margins are not included. All costs related to a service, i.e. direct and supervisory labor costs, fringe benefits, general and administrative overhead costs, direct material costs and other service associated costs are compiled and are divided by the number

of direct productive labor hours to determine an appropriate service price expressed in dollars per labor hour expended. Rates are established for each type of service that is provided. Customer Commands, therefore, are aware of the price for each type of service which they request from a PWC.

The financial structure of a PWC requires it to be managed like a private business. The initial capitalization provided to an industrial fund can only be maintained if its income equals its expenses. PWC managers are faced with the same decisions and trade-offs as their counterparts in private business. The significant differences are that a PWC is not profit oriented and does enjoy a legal monopoly. The problems typically found in private business exist in PWC operations; personnel management, financial accounting, financial management, inventory control, balancing labor force with workloads, and production control. The requirement that a PWC operate at zero profit, but also at zero loss, distinguishes it from the majority of Naval Commands that operate on a basis of expending appropriated funds without generating any income.[1]

Typical PWC Organization

The organization of a typical PWC, excluding PWC San Diego, is shown in Appendix A. The management team is comprised of

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[1]Other Navy Commands operate with revolving Navy industrial funds i.e. ship repair facilities, air rework facilities, shipyards, laboratories and weapons stations. These, however, are in the minority when compared to the number of Commands that are appropriated funded.

senior civil service personnel and Civil Engineer Corps (CEC) officers. Personnel composition of a PWC ranges from 600 to 3,300 civilians and averages 11 CEC officers.

The organization is divided into two main components, planning and operations groups, that both report to an Executive Officer. The planning group initially receives, designs, plans, estimates, and schedules the work to be accomplished. The operations group includes all the productive labor forces of a PWC that produce the end products or services requested by customer Commands. These two groups operate semi-independently of one another. However, they are interrelated since a majority of the work requirements pass through the planning group prior to their accomplishment by the operations group.

Activity Civil Engineer billets are staff positions under the Executive Officer and are directly supervised by a Senior Activity Civil Engineer. While ACEs are the primary liaison with the customer Commands of a PWC, they have no formal line authority and, therefore, no direct control over PWC resources.

PWC San Diego Organization

The PWC at San Diego, California, is organized differently than the other PWCs, as shown in Appendix B. It is possibly the prototype of future PWC organizations.

The most significant organizational difference is the consolidation of daily planning functions with daily production functions under one coordinative and control position: the Production Officer.

The Production Officer is responsible for planning, administering, coordinating and directing the functions of the production departments i.e. production control office, service, maintenance, utilities, and transportation departments.

A production control staff is responsible for programming day-to-day customer work through the production departments to maintain response targets and completion dates. This office is the nerve center of PWC San Diego. No other PWC organization has a comparable centralized monitoring or control point.

Other major changes involve the planning and material functions. The newly formed service department incorporates work acceptance, production engineering, job estimating and planning, and material support. The reorganization separates production engineering from facilities engineering and incorporates the former material services, production engineering functions, planning, and estimating functions into one service department under the Production Officer. The other production departments, maintenance, utilities, and transportation, retain their names and most of their former functions.

The ACE office in the PWC San Diego organization is not altered while its responsibilities only change slightly. The ACE continues to be the primary liaison between the PWC and its customers.

III. ORGANIZATIONAL HISTORY

In researching the historical development of Activity Civil Engineer and Staff Civil Engineer billets, it was considered appropriate for full understanding of the problem to describe the evolution of public works support, Public Works Centers and changes in the structure of the Navy which have affected the use of an ACE and SCE.

Post World War II Demobilization

In 1945, the Navy had completed a large expansion of its Naval shore establishment needed for the commitments of World War II. In 1946, Rear Admiral John J. Manning, CEC, USN, then Chief of the Bureau of Yards and Docks (BUDOCKS), recognized that the Navy faced a monumental task in reducing its wartime facilities to a peacetime scale while remaining capable of meeting future defense needs [Ref. 1, p. 2].

In 1948 the Navy began to consolidate redundant support services to realize economies, reduce capital expenses and lower operating costs. The Fifth Naval District at Norfolk, Virginia, was a beginning point. As part of the centralization, the Secretary of the Navy established the first Public Works Center at Naval Base, Norfolk, Virginia, on June 15, 1948. Initially, not all activities in the Norfolk area were required to obtain their public works services from the Center. It wasn't until June 30, 1960, that the Secretary directed the complete consolidation of all public works functions at

Naval Base Norfolk into PWC Norfolk. He also directed the integration of public works services at five other existing PWCs [Ref. 2]. This was a major change in Navy public works services. Naval units still budgeted for facility funds, but the new policy required them to obtain support from PWCs to implement resource expenditures. Before this policy, each activity at a Naval base had its own public works forces, with its own officers and men. Under the new system, a PWC consolidated these independent overhead functions and support services. The ACE job was created to link customers and the PWC while looking after the best interests of the customer.

Single-Manager Concept

The PWCs remained under the supervision and command of BUDOCKS, and the link with public works support was further strengthened in 1962, as discussed by Rear Admiral P. Corradi, CEC, USN, then Chief of the Bureau of Yards and Docks:

> "New authority is established, vesting single-executive control of all maintenance and utilities operations throughout the Navy shore establishment in the Chief of the Bureau of Yards and Docks" [Ref. 3, p. 3].

RADM Corradi went on further to state that,

> "The single-manager authority, employing engineered maintenance management capability will guarantee uniformity of response and performance" [Ref. 3, p. 3].

This authority became a high point for BUDOCKS in facilities management. It was felt by BUDOCKS that funds allocated for maintenance and utilities operations in the past were not always being spent for those functions and this led to an

imbalance in Navy wide facilities maintenance programs. Now BUDOCKS was in a position to correct the imbalance. Corresponding to the single-manager concept was a growth in BUDOCKS public works programs and strong implementation through Naval District Public Works Offices (DPWOs), later to be known as Engineering Field Divisions (EFDs). The DPWOs worked closely with each activity in a Naval District on public works matters and acted not only as a monitor for maintenance spending, but as a vast reservoir of expertise on all public works functions. Accordingly, activities relied upon this expertise to meet their requirements.

Unilinear Navy Concept

In 1967 the unilinear Navy concept had even more affect on public works management, especially at those activities being supported by PWCs. The unilinear Navy merged command and support. BUDOCKS, known today as NAVFACENGCOM, was no longer single-executive for facilities management, and the financial aspect of facilities management was reassigned to Command on July 1, 1967 [Ref. 4, p. 17]. The consequences of this structural change were far reaching and marked the start of a decline in NAVFAC's ability to sustain public works management and technical support at previous levels under a single-manager authority.

In terms of the Navy structural environment the change to a unilinear concept was devastating to NAVFAC's public works program. Navy maintenance funds were no longer controlled by NAVFAC and with that loss in control went the

"power of the purse." Whereas before, NAVFAC through its EFDs was able to support a balanced facilities maintenance program that was uniform Navy wide between activity needs and funds available, it was now relegated to responding to request from major claimants and commands.

NAVFAC's Response To The Unilinear Concept

With the change in structure NAVFAC needed guidance on how it should proceed for the future and how it could best serve in the command-support relationship. NAVFAC's response was to develop a plan for the future of NAVFAC and the CEC. A study entitled A Study Of Civil Engineer Corps Career Development, Education and Training, Phase-One Report of the Board, was undertaken by a board of CEC officers in NAVFAC. The study, reported in June, 1968, and set a spectrum of plans and guidelines for the future structure of NAVFAC and CEC roles in the unilinear Navy. In regard to the role of public works, the study found that the traditional job of public works officer was a continuing and valid requirement for the future and that the CEC officer would be required to fill that job at all levels of rank.

The study also looked at the merging of command and support in connection with PWCs:

> "The merging of command and support calls for a reexamination of the staffing of PWCs with Activity Civil Engineers (ACEs). These are normally junior officers, on the rolls of the Center, assigned liaison functions with specific support commands. With commands being responsible for obtaining their own support, with increased fund flow through command, many commands

have expressed a need for a Staff Civil Engineer on their rolls. Such an assignment would replace the ACEs and should enable the command to develop better execution plans (to benefit of the Centers) and would result in greater command confidence.

Thus, the Board concludes that the concept of ACEs should be revised and that some officers should have primary duty as civil engineers on the staffs of the major supported commands" [Ref. 4, p. 32].

Phase-Two And The Zero-Base Study

In January, 1971, NAVFAC completed a follow-up investigation, Status of Implementation of the Phase-One Study of Civil Engineer Corps Career, Development, Education and Training. It basically gave implementation status of those recommendations made under Phase-One. The final portion of the Phase-Two study completed in June, 1972, was A Zero-Base Analysis of CEC Billet Requirements and A Study of the Related CEC Structure.

Three major considerations in the ideal Corps structure pertaining to the CEC role in the unilinear Navy were proposed by the Zero-Base study:

"1. The smaller, high quality Navy of the future requires the most efficient and effective use of all its officers. This objective can best be achieved in facilities matters by drawing all facilities functions together at one spot in each activity, staff, command, and force. The focal billet for facilities matters should be a CEC officer.

2. Facilities advice and assistance should be located where the decisions are made and the funding is allocated. Therefore, CEC expertise should be placed on the staffs of major claimants and commands for this purpose.

3. The CEC officer on a staff has two unique qualifications that, if used effectively, provide the staff with increased capability. The special qualifications are:

a. Personal expertise in facilities matters.

b. Ease of access to NAVFAC and EFD expertise, assistance, and resources" [Ref. 5, p. 10-11].

Accordingly, the Zero-Base study echoed previous NAVFAC policy that with the changed flow in command and support in public works, a CEC officer within that activity was essential to using the expertise in Navy facilities management.

The Zero-Base study also looked at the problem of providing total public works support to those activities supported by PWCs. In the past, EFDs had been able to totally support activities in public works matters and now with the decline in NAVFAC's and EFD's public works programs a void in expertise at the activity level had developed. The Board proposed to solve the problem as follows:

> "The Board concludes that the Public Works Center currently is not constituted to carry out the total public works functions of the activities served. The PWC provides basically shop and engineering services. The Board finds that an activity served by a PWC requires someone to perform many of the planning, budgeting and other functions normally done by a public works officer. To this end, emphasis has been placed on the use of Staff Civil Engineers on the rolls of the larger customer activities vice Activity Civil Engineers on the rolls of the Public Works Center. The Board finds that a key element to successful interface between activities and a PWC is prior public works experience of Staff Civil Engineers, Activity Civil Engineers and other PWC personnel. Accordingly rank and experience requirements for these personnel have generally been increased" [Ref. 5, p. 6].

The advent of the unilinear concept meant that NAVFAC lost the management control of Navy Public Works maintenance dollars it had under the single-manager concept. With

the resultant reduction in EFD public works management support to activities and the fact that PWCs were not providing public works financial management support to its customers, unforseen consequences were felt at Fleet activities served by PWCs.

NAVFAC responded to the change by first defining its new role in the unilinear Navy and second by developing specific recommendations to meet public works challenges of the future. The key to the new era lay in getting CEC officers as close as possible to decision points in facility maintenance funding. Increasing numbers of SCEs were seen as the method by which this could be accomplished at activities served by PWCs. Thus, the move to increased SCEs and decreased ACEs was undertaken by NAVFAC to maximize CEC expertise in the field and facilitate public works financial management.

With this background in mind our purpose is to study the major policy shifts in public works and determine the outcomes of recommendations made by Phase-One, Phase-Two and Zero-Base studies as they affect ACE and SCE roles in support of Fleet activities.

IV. RESEARCH METHODOLOGY

The sponsorship of this study by PWC San Diego provided for on-site research at PWC, San Diego. We had tentatively decided that this could most effectively be accomplished by conducting personal interviews of those concerned and interested in the role of the ACE and SCE at San Diego.

SCE billets were included in our research for two primary reasons. First, we wanted to be able to compare functions of ACE billets to those of SCE billets to clearly identify similarities and differences. The jobs are frequently discussed and classified as one, but we felt that although they both serve as communication links between a PWC and its customers, the functions are different and distinct. We wanted to be in a position to be able to distinguish between the two billets. Second, based on our experience and knowledge of the two jobs we assumed that SCE jobs provided substantially more satisfaction than ACE jobs. We sought evidence to prove or disprove this assumption.

We also felt that some of our findings would apply to other Public Works Centers. Accordingly, two distinct stages of this study emerged.

Stage-One Methodology

Stage-one gathered information from all PWCs, Activity Civil Engineers, and Staff Civil Engineers, except in the PWC San Diego area. This was done by letter to each Commanding

Officer and by a survey form to each ACE and SCE. Our intent was:

a. To query all sources for ideas about ACE and SCE jobs.

b. To gain some insight into problems that exist at all PWCs regarding ACE billets.

c. To try to determine what common problems exist at all PWCs regarding ACE billets.

d. To determine if solutions developed at one PWC could be used at other PWCs.

e. To prepare ourselves for interviewing at PWC San Diego, focusing on the important issues that might exist at all PWCs.

The first stage was comprised of six parts:

1. Survey of PWC Commanding Officers — We asked each Commanding Officer to provide Command policy relevant to ACE positions at his PWC as well as his personal views about the ACE and SCE role. In a letter we requested the following information:

a. Command organization charts showing ACE position.

b. A listing of ACE and SCE billets and Command assignments.

c. PWC and customer Command instructions related to ACE and SCE functions.

d. A listing of personnel support provided to ACE and SCE by PWC and customer Command.

e. Comments concerning changes which occurred in ACE and SCE organization and procedures and reasons for such changes.

f. Personal comments concerning the relationship between PWC and ACEs and SCEs.

The PWC Command perspective of the ACE billet was considered to be an important part of our overall understanding of ACE responsibilities.

2. Interviews at Western Division, Naval Facilities Engineering Command [WESTDIV) — Just after letters were sent to the PWC Commanding Officers, it was brought to our attention that the ACE billet was a current concern at WESTDIV. Subsequent to an inspection which WESTDIV conducted at PWC, San Diego, WESTDIV prepared a point paper recording perceptions gained during the visit.[2] Since WESTDIV is the immediate senior of PWC San Diego in the chain of command, we thought it important to pursue the genesis of this paper to learn the WESTDIV view of ACEs. Consequently, a day was spent interviewing the author of the point paper and Code 09B at WESTDIV.

3. Survey of ACEs and SCEs — With the concurrences of each PWC Commanding Officer, a written three-part questionnaire, containing thirty-four questions, was sent to all incumbent ACEs and SCEs and to selected junior officers who had been assigned to these billets in the past years. Out of 108

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[2]In brief, the point paper discussed the functions which the ACEs are and are not performing. The conclusion reached was that the ACE office needed some minimum civilian support to assist in its functions or integrate the ACEs into the production organization and give them line authority over civilian resources.

questionnaires sent, 52 responses, or 48% were returned. A 50% response is typical in social science research, according to Dillman et. al. [Ref. 6, p. 744-756]. Since the survey was to be conducted only once, the questions were structured to encourage open ended rather than multiple-choice or Likert responses. An open format usually elicits more of what is on the respondents mind. This form of survey is best for exploratory studies such as this one, according to Maccoby and Maccoby [Ref. 7, p. 449-487]. Had the data been collected more than once over a period of time, Likert-type scales or ranked multiple choice answers would have been used to measure changes in attitudes.

This survey was not sent to ACEs and SCEs at PWC San Diego to insure that their responses in the personal interviews would be spontaneous and unbiased by those of their peers.

4. Interviews at PWC San Francisco — After receiving replies to the ACE and SCE questionnaires, a preliminary compilation and analysis of the data was performed. These early results cast doubt on the strength of the questionnaire. To get more feedback on the validity and adequacy of our questions, we interviewed ACEs and SCEs at PWC San Francisco. This group discussion gave us face-to-face reactions to the questions. We found that the questionnaire stimulated the discussion needed for person interviews. This discussion of ACE and SCE problems furthered our understanding of their work difficulties.

5. Interviews At Civil Engineer Corps Officer School (CECOS) — Two trips were made to CECOS, Port Hueneme, California, to gather information on public works training provided to junior officers and to gain insight into NAVFACENGCOM's view of public works management in the unilinear Navy.

The first trip involved discussions with the instructor of the public works course to become familiar with training of initial tour junior CEC officers prior to their assignment as ACEs in Public Works Centers. The instructor's ideas about ACE billets in general were recorded.

The second trip was made to attend a portion of the Navy Facilities Systems course for CEC officers in middle-management billets. During the course, current and long-range policy plans of NAVFACENGCOM regarding NAVFAC's Command Management Plan (CMP), which included public works, was discussed by top NAVFAC management.

6. Other Data — Information was received from NAVFACENGCOM representatives regarding current and proposed policy on instructions relevant to ACE billets, listings of active-duty CEC officers, officer retention statistics, and NAVFAC CMP information.

Historical data concerning PWCs and public works was obtained from the Ben Moreell Library at CECOS, as well as data from the NAVFACENGCOM Historical Records Office, at Port Hueneme, California.

In an attempt to determine the affect of ACE duty on CEC career incentives, the names of all officers filling ACE

billets from January 1, 1970, to the present were compiled for all PWCs.[3] The retention rate of ACEs was compared to the overall CEC retention rate. While these two rates are not directly comparable, they provide an approximate measure.

Stage-One Data Analysis

The information gathered from the PWC Commanding Officers was reviewed and comparisons were made of PWC organizations and ACE and SCE billet assignments and functions. Three Commanding Officers personally commented on the relationship of PWC with the ACEs and SCEs.

The ACE and SCE questionnaires were divided into two groups: ACEs and SCEs. The responses for each question for each group were reviewed and qualitatively evaluated. Where possible, a composite reply was constructed for each question representing a majority of the responses. The intended purpose of developing a majority position for each question was to formulate an outline of the more critical problem areas which were common to all of the PWCs. Similar problems addressed by the questionnaire exist at all PWCs and vary only slightly. This analysis helped us to focus more clearly on the issues to be covered in the interviews at San Diego. Appendix C provides the questionnaire with composite ACE and SCE answers for each question and the transmittal letter.

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[3]PWC San Francisco was excluded because it is newly established as of July 1, 1974, and ACE billet statistics do not exist prior to this time.

Stage-Two Methodology

The second stage of this study consisted of person interviews during two weeks at PWC San Diego. The interviews included all PWC Activity Civil Engineers and Staff Civil Engineers, senior PWC civilian and military managers, and Commanding Officers of two customer Commands. In total 23 interviews were conducted. Our intent at PWC San Diego was:

a. To determine the existing requirements of the ACE and SCE billets.

b. To determine what functions ACE and SCE billets actually performed.

c. To determine the role of ACEs and SCEs in the relationship between PWC and customers.

d. To determine what functions the ACE and SCE billets should perform.

e. To identify the reasons for job dissatisfaction and what changes might be instituted to improve ACE billets.

The interview schedule, prepared by PWC San Diego, provided for two, four hour interviews each day. The length of interviews with ACEs and SCEs ranged from three to four hours. The other interviews were considerably shorter and ranged from thirty minutes to an hour.

ACE And SCE Interview

Each ACE and SCE interview was conducted in private, with as little interruption as possible. Both of us participated in each interview. The survey questionnaire, developed in

Stage-One, was used as an outline for the discussions and was tailored to fit the circumstances of each interview. The interviewee was encouraged to deviate from the questionnaire when necessary to express a point. No effort was made to limit the scope of the responses; rather, each interviewee was encouraged to speak his mind freely. While one of us guided the discussion and asked questions, the other recorded responses and developed additional questions on the spot. Some of the interviews, particularly those with SCEs who had not been ACEs, did not follow the outline of the questionnaire, because it was determined that they were performing in the intended manner and it appeared unnecessary to belabor the questionnaire. In these cases, a free form discussion was conducted which focused on the SCE's relationship with and his perceptions of the PWC.

PWC Management Interview

After interviewing ACEs and SCEs, we turned our attention to the PWC senior civilian managers and then to the PWC military managers. These interviews were shorter in time than those with the ACEs and SCEs and did not follow an outline. We developed different discussion points for each interviewee based on information and questions which had evolved from the interviews with the ACEs and SCEs. We sought reinforcing or contradictory information to test for the perceptions of the ACEs and SCEs. We concentrated on the PWC production-control group and its relationships with the ACEs, other PWC departments, and the customer Commands. We also

spent time with the Executive Officer and Commanding Officer to acquire an understanding of their policy related to ACEs and SCEs.

We gathered data in other areas which had not been planned. To acquaint ourselves with the new computer based management control systems PMS II (Production Management System), being installed at PWC San Diego, we received a two hour briefing on the basic concepts and operations of PMS II by NAVFACENGCOM Code 1051,PW Systems Branch, located at PWC San Diego. We wanted to understand the capability of the system to provide management control within the PWC.

Customer Interview

Finally, to answer questions that arose during the interviews about the relationship between an ACE and his customer, we interviewed the Commanding Officers of two customer Commands of PWC San Diego.[4] The purpose of these interviews was to determine how the customer viewed the ACE, to what extent he felt he could rely on the ACE to represent his Command, and how the Command could better use the ACE if he were able to devote more time to his customers.

Stage-Two Data Analysis

The information obtained from each of the interviews at San Diego was compared with that from the other interviews in an attempt to develop an objective perception of the PWCs

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[4]Both Commands hold plant account and receive MRP funds to maintain their real property.

operation and the role of ACEs and SCEs in it. We concentrated on developing model perceptions. We also examined the reasons behind the perceptions that were held.

Summary

This is an exploratory study of a large and complex problem. The findings here were developed from a small and not statistically significant sample. Nonetheless, the documentation of these perceptions which exist and affect the operations of a PWC must be of vital interest to those facing the problems of PWC operations.

V. FINDINGS

A. CEC PUBLIC WORKS DISTRIBUTION

Table I: This data looks at the CEC officer strength overall in regards to distribution of officers by duty function beginning in FY 76:

TABLE I

FY 1976 CEC OFFICER DISTRIBUTION BY DUTY FUNCTIONS[5]

FUNCTION	CAPT/CDR		LCDR/LT		LTJG/ENS/WO		TOTAL	
Contract Admin	27	9%	108	16%	68	16%	203	14%
Public Works	95	31	231	34	209	49	535	38
Seabees	21	7	105	15	77	18	203	14
Staff	69	23	119	17	24	5	212	15
NAVFAC/EFDs	73	24	36	5	7	2	116	8
Other	18	6	87	13	43	10	148	11
TOTAL	303	100%	686	100%	428	100%	1,417	100%

Table II: This data compares the public works portion of the functional distribution of CEC billets in FY 1972 with those in FY 1976:

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[5] Civil Engineer Corps Directory, NAVFAC P-1, P. 69, Summer 1975.

TABLE II

FY 1972 AND FY 1976 PUBLIC WORKS DUTY FUNCTION AND RANK DISTRIBUTION

YEAR	FUNCTION	CAPT/CDR		LCDR/LT		LTJG/ENS/WO		TOTAL
FY 72[6]	Public Works	122	36%	323	51%	147	38%	592
FY 76	Public Works	95	31%	231	34%	209	49%	535

Inspection of Table I indicated that public works was by far the CEC's major area of responsibility in terms of numbers of billets as 535 CEC officers or 38% of the CEC billets were dedicated to public works functions. This distribution agreed with the Phase-One study comment that future public works officer roles were stable and billets were hard core in the CEC to meet the needs of the unilinear Navy [Ref. 4, p. 32]. The roles ranged from independent public works officers to officers assigned to Public Works Centers where as many as thirteen CEC officers had been assigned to carry out PWC operations.

Looking further at the public works CEC distribution, a review of Table II showed that there had been an overall reduction in numbers of public works officer billets since FY 1972. In addition, since FY 1972 there had been a significant down shift in numbers (323 to 231) and percentage (51% to 34%) of LCDR/LT billets. Concurrently, there had

[6]Cdr. C.A. Merica, "Status of the Civil Engineer Corps in the Summer of 1971", Navy Civil Engineer, p. 6, special edition, 1971.

been an increase in numbers (147 to 209) and percentage (38% to 49%) of LTJG/ENS/WO billets. This reduction in numbers of officers in public works could be explained by the overall reduction in Naval personnel. Likewise the shift in billet distribution from LCDR/LT to LTJG/ENS/WO could be attributed to the Zero-Base study which stated:

> "... maximize the meaningful use of CEC officer resources especially at the ENS, LTJG and LT level and billets which result in productive essential work and at the same time provide professional development and job satisfaction for the officer" [Ref. 5, p. 26].

However, there was another factor that acted as a trade-off in the benefits derived from the shift in distribution. Given the axiom that the more senior the CEC officer the more experienced the officer is in solving public works problems, Table II also indicated that the level of expertise in public works was in a decreasing trend, and less public works experience was available to Fleet activities, except for PWC areas where there was concentrated CEC expertise.

B. NAVFAC CMP PUBLIC WORKS SERVICE GOALS

The FY 1976 NAVFAC Command Management Plan (CMP), NAVFAC P-441, which is the basic planning document of the Naval Facilities Engineering Command, was reviewed to ascertain NAVFAC's responsibility for implementing total Public Works support in the Navy. Program IX, Public Works, of the objectives portion of the CMP outlines the intermediate goals (2 to 5 years ahead) of public works support, broken down by

product, service, support improvement, and performance goals categories.

Service Goals are defined by the CMP as major services provided by the Command for the client and under Service Goals of Program IX, Public Works, Objectives Plan, we found the following goals:

"92H REAL PROPERTY PPBS ASSISTANCE – Provide assistance by request or delegation in determination of funds requirements and allocation for maintenance, operations, utilities and transportation to:

(1) Activities
(2) Claimants or Major Commands
(3) CNO
(4) Commandants or NAVBASE Commanders

(Includes assistance in the preparation and execution of the Facilities Management portion of the annual budget submission pursuant to OPNAVINSTs 11010.27B and 11010.23B; the development, presentation, execution and appraisal of Navy-wide RPMA requirements; and special project preparation and review.)

921 PUBLIC WORKS MANAGEMENT/INDUSTRIAL ENGINEERING ASSISTANCE – Respond to requests for management/industrial engineering assistance at:

(1) Activities
(2) Claimants or Major Commands

(Includes Engineering Service Requests, professional industrial engineering and management science assistance for the improvement of management and economy of operations of Navy real property; development, updating, installation, and training in EPS: control inspector training; layout studies; and organization and staffing criteria development and use.)

92J PUBLIC WORKS TECHNICAL ASSISTANCE – Respond to requests for assistance in the solution of engineering/technical problems in maintenance, operation and repair at:

(1) Activities
(2) Claimants or Major Commands

(Includes Engineering Service Requests, consulting service and guidance for the upkeep of buildings, grounds, roads, waterfront structures and other public works; and identification of facility deterioration and recommended solutions; AIS assistance, validation and review; rail inspections; elevator inspections; maintenance service contracts and Navy applied Biology Program.)

92K UTILITIES ENGINEERING ASSISTANCE — Respond to requests for assistance in solution of engineering/ technical problems in utilities management and engineering at:

(1) Activities
(2) Claimants or Major Commands

(Includes UIP surveys, fuel conversions, CAPSE studies, corrosion protection, IC-17 adivsor, utilities policy formulation, and boiler water program)" [Ref. 8, p. B-24-B-25].

In reviewing these service goals, we clearly found that financial and facility management was vested in the activity, claimant and major command. NAVFAC is not charged by CNO with responsibility or authority to implement policy in these public works areas as set forth in OPNAV instruction 11010.23C [Ref. 9]. NAVFAC's mission is to respond to requests for assistance in these public works service areas of real property PPBS, management industrial engineering, technical and utilities engineering.

C. NAVFAC CMP PUBLIC WORKS SUPPORT

Table III looks at funds expended for various NAVFAC CMP programs, which is one measure of Command emphasis. We found that NAVFAC in FY 1976 had planned to spend its in-house dollars (operating budget) on nine Command programs, excluding PWC inputs, as indicated by the percentages in Table III:

TABLE III

FY 1976 NAVFAC IN-HOUSE DOLLAR PERCENTAGES BY CMP PROGRAM[7]

	PROGRAM	PERCENTAGE
I	Research	8.0%
II	Planning & Real Estate	6.0
III	Engineering	4.0
IV	Construction	32.0
V	MILCON Programming	0.4
VI	Seabees	28.0
VIII	Housing	1.6
IX	Public Works	8.0
X	Administration	12.0
		100.0%

From Table III we found that program IX, Public Works, was fourth behind Construction, Seabees, and Administration in budgeted in-house dollar support.

Table IV shows another measure of support in the NAVFAC CMP. By reviewing numbers of civilian ceiling points allotted in the CMP for the nine Command programs, excluding PWC inputs, we developed the breakdown by program shown in Table IV.[8]

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[7] FY 1976 Command Management Plan; NAVFAC P-441, June 1975, Part C., Chapter 3, Resource Summaries.

[8] Public Works Center input for funds and personnel is excluded and is discussed in Section D of Findings.

TABLE IV

FY 1976 NAVFAC CIVILIAN PERSONNEL ALLOTMENT BY CMP PROGRAM[9]

	Program	NAVFACHQ	EFDs	CBC	TOTAL	PERCENTAGE
I	Research	14	2	321	337	4.2%
II	Planning/ Real Estate	83	298	0	381	4.8
III	Engineering	111	188	30	329	4.1
IV	Construction	85	2,371	0	2,456	30.8
V	MILCON Programs	35	0	0	35	0.4
VI	Seabees	39	4	2,741	2,784	34.9
VIII	Housing	34	102	0	136	1.7
IX	Public Works	89	445	22	556	7.0
X	Administration .	149	815	3	967	12.1
		639	4,225	3,117	7,981	100.0%

Again we found that NAVFAC Command dedicated support in personnel ceiling points for the Public Works Program was far less than that allocated for Construction, Seabees, and Administration Programs.

Thus, a review of NAVFAC in-house funds and personnel ceiling points indicated that other NAVFAC Command Programs such as Construction, Seabees, and Administration received far more emphasis than that alloted to Public Works. Data

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[9] FY 1976 Command Management Plan, NAVFAC P-441, June 1975, Part C, Chapter 3, Resources Summaries.

concerning NAVFAC total public works support showed that the public works arm of the NAVFAC Headquarters and EFDs had been declining and had provided less public works management support at the activity level since the unilinear Navy concept went into effect in 1967. The basic reason given was the overall cut-back in Navy resources. As a result, NAVFAC had to squeeze the Code 09B, Facilities Management, functions down in the NAVFAC system in order to have sufficient resources to keep remaining programs going. This would certainly follow in any agency where overall resources were decreasing and the agency no longer controlled the funds to maintain an end-product for which the agency "only provided assistance upon request."

NAVFAC Competes For Limited Resources

We found that NAVFAC in its current command-support position was competing for limited resources in a total Navy arena. Competition for these resources was strong, aggressive, and influenced by external objectives. NAVFAC was attempting to obtain maximum dollars that were available to the latest Fleet and activity projects. It had to convince reviewing authorities that resources provided to NAVFAC were being spent to the best of their ability and would do more good there than anywhere else. In so doing the alternatives were:

1. Take resources received each year and apply these dollars toward the end goal of changing the rules by which the Navy now carried out its facilities management responsibilities.

2. Consider the existing Navy rules as being paramount, where resources were spent in a manner to get the most for the dollars available out of the existing system.

The NAVFAC CMP system is understandably oriented toward the second alternative. The atmosphere for changing the rules is not bright. The NAVFAC Code 09B area has little chance to regain its previous share of influence or level of support to activities within the near future.

D. PUBLIC WORKS CENTERS — TOTAL PUBLIC WORKS SUPPORT

Table V: Looking at the NAVFAC CMP and the support to Public Works, Program IX, provided by NAVFAC, when including PWC input, we found data shown on Table V.

TABLE V

NAVFAC CMP IN-HOUSE RESOURCE ALLOTMENT[10]

Public Works Support Item	With PWC Input	Without PWC Input
In-House Funds	67%	8.0%
Personnel Ceiling	63%	7.0%

Comparing CMP Program percentages, when including PWC input, it would seem that Public Works, Program IX, at 67% is the major program when comparing CMP Program percentages. However,

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[10] FY 1976 Command Management Plan; NAVFAC P-441, June 1975, Part C., Chapter 3, Resource Summaries.

the 67% is made up of customer reimbursable dollars under the NIF concept and a very small percentage of NAVFAC's mission management funds from O&MN appropriations. Therefore, these PWC dollars did not represent a significant portion of NAVFAC's operating budget dollars and should not be designated Program IX In-House funds.

The total increase in personnel ceiling points was more valid. These ceiling points were allotted for the total NAVFACENGCOM system relationship, including PWCs. However, almost all PWC ceiling-point salaries are paid out of NIF operations and these points are sustained for customer workload at PWCs. An issue remains as to real total public works input to a PWC served activity when considering budgeting and financial operating plan support.

NAVFAC CMP And PWC

NAVFAC's CMP does not assign any annual or intermediate goals indicating that PWCs are to provide total public works functional support assistance in activity facilities budget and financial operating plans. Only one overall service goal is stated as:

> "Public Works Center operations — provide mission management and other Public Works services to activities served by PWCs" [Ref. 8, p. B-26].

This goal is an overall mission statement and NAVFAC's CMP appears to provide only general guidance in the area of PWCs.

Public Works Center Mission

A search of NAVFAC Instruction 5450.82B of June 4, 1970, found the mission statement for PWCs:

> "The mission of the PWCs is to provide public works, public utilities, public housing, transportation support, engineering services, shore facilities planning support, and all other logistic support of a public works nature incident thereto, required by the operating forces, dependent activities, and other commands served by the PWC" [Ref. 10].

The mission was basically oriented towards facilities planning, production engineering and public works shop services, and not directed towards providing activities with total public works management support. Activities obtained their full public works type maintenance, transportation, engineering services, and utilities support from a PWC. Except for facilities planning and inspection services, these functions were provided on a reimbursable basis. Commanding Officers of activities retained financial responsibility for public works matters on all of their facilities, and PWCs were not specifically tasked to provide financial management support.

Public Works Center — Financial Management Support

Even though PWCs were not specifically tasked by NAVFAC to provide total public works support, our search did find the subject discussed in NAVFAC's A Guide for Public Works Center Commanding Officers of October 1971:

> "Facilities Budgeting: Ideally the Activity Civil Engineer and the Staff Civil Engineer participate intimately in developing the

facilities budget for their command. We are still a long way from the ideal. You are urged to recommend to the Commanding Officers your support that they use the talents of these young Civil Engineer Corps Officers who have behind them the total capability of the Public Works Center and the EFD/ NAVFACREP in developing facilities budgets for their commands" [Ref. 11, p. 9].

Public Works Center — Zero-Base Study On Public Works Support

The Zero-Base study indicated that PWCs were not constituted to carry out total Public Works functions of the activities served. It also indicated that an activity served by a PWC required planning and budgeting functions [Ref. 5, p. 6]. We found that facilities planning was provided by PWCs, was part of the PWC mission and was supported by NAVFAC mission management funds.

As for budgeting assistance, PWCs were constituted to carry out financial assistance when looking at available expertise and financial data. Currently, PWCs did not have a specifically assigned function in this area, but the capability to provide support to activities in budgeting and financial operating plans did exist in PWCs. This subject is discussed further under PWC San Diego and Total Public Works Support.

Table VI: ACE Detailing Rank Structure Within CEC

By researching ACE detailing records at six PWCs we were able to determine — The ACE Detailing Rank Structure Within the CEC. Table VI shows data for two time periods: January 1970 - January 1974 and January 1974 - January 1976:

TABLE VI

ACE DETAILING RANK STRUCTURE WITHIN THE CEC

FOR SIX PWCs[11]

January 1970 - January 1974

Activity	ENS	LTJG	LT	TOTAL	Ensign PERCENTAGE
Subic Bay	7	0	2	9	77%
Great Lakes	10	3	0	13	76
Norfolk	15	4	1	20	75
San Diego	5	6	5	16	31
Pearl Harbor	6	4	11	21	29
Yokouska	2	10	3	15	13
TOTAL	45	27	22	94	48%

January 1974 - January 1976

Activity	ENS	LTJG	LT	TOTAL	Ensign PERCENTAGE
Subic Bay	2	0	0	2	100%
Great Lakes	4	3	0	7	57
Yokouska	2	2	1	5	40
Pearl Harbor	3	3	4	10	30
Norfolk	2	4	1	7	29
San Diego	1	4	2	7	14
TOTAL[12]	14	16	8	38	37%

Data from Table VI provided support to show that not only were total numbers of ACEs decreasing, but also the percentage of Ensigns being assigned to ACEs billets was

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[11]Data for PWCs Guam and Pensacola were not available by year grouping at time of analysis. PWC San Francisco was not included due to a commissioning date of July 1974.

[12]All CEC officers having held or now holding ACE billets were included in analysis. SCEs and Senior ACEs were not included.

declining as well. Between January 1970 - January 1974, 48% of the ACE billets were held by Ensigns and between January 1974 - January 1976, 37% of the ACE billets were held by Ensigns. This data confirmed the Zero-Base recommendation to increase the rank structure of ACE billets to provide more Naval experience to these billets and better serve Fleet Activities.

PWC – ACE Public Works Experience

A review of ACE survey data showed that junior CEC officers being detailed to ACE billets at PWCs did not have prior public works experience as recommended by the Zero-Base study.

This was not surprising when considering the logic of detailing and incentives for career motivation: (1) Ensigns and line-transfer officers could not have prior public works experience as they are serving their first CEC tours; (2) Lieutenant Junior Grade officers would not normally serve in a public works department as Ensigns and then request ACE tours at PWCs. This would be back to back tours in public works. It would not allow those junior officers an opportunity to feel out the remainder of CEC duty functions before reaching their minimum service requirement.

Exceptions to this logic can be found, but we were unable to detect any trend towards increasing the number of ACEs with prior public works experience.

With the decrease in public works program support through the NAVFAC system, smaller activities were not receiving

total public works support through the EFDs either. Thus, it would appear that a gap in public works budgeting and financial expertise as envisioned by the Zero-Base study existed at those activities served by ACEs.

E. PWC SAN DIEGO – TOTAL PUBLIC WORKS SUPPORT

A search of PWC San Diego instructions, PWC Insturction 5450.2E of April 1975, Manual of Organization and Functions, indicated that the San Diego ACE office provided support to customers in preparation of their facilities budgets and execution plans. However, based on information from ACE on-site interviews, assistance in this area by the ACEs was limited to projected budget rates for Center services. Further discussion with PWC management indicated that in past years this support was greatly expanded and activities did receive budget packages and sufficient assistance to develop financial operating plans. However, in recent past years this support has declined because of: (1) increasing numbers of activities served; i.e. increased financial workload; (2) major claimant budget call procedure decreased time available for Center response; and (3) activities were developing their own cost records to respond to major claimant inquiries on budgeting and operating plans.

The point remained that PWC San Diego, like other PWCs, was potentially organized to develop and provide required fiancial data to support their activities; but current emphasis was not directed toward doing so. PWC San Diego ACEs were not

participating nor receiving training in activity facilities financial management.

Our search at other PWCs on activity financial management support also indicated that limited support being provided is similar to that amount being provided activities at PWC San Diego. It may be that the current Navy emphasis on NIF rate stabilization policies will reverse the current trend and that activities will request more support from PWCs in the area of financial management.

PWC San Diego – ACE Rank Structure

We were able to concentrate on current PWC San Diego ACE detailing. Beginning in August, 1974, considering the last six ACE details, one ACE arrived as an Ensign, four of the other five arrived as Lieutenant Junior Grade officers, and the remaining arrived on board as a Lieutenant, for an Ensign detailing average of 17%. Detailing information from January, 1970, to January, 1974, showed that there was a mix of Ensigns and Lieutenant Junior Grade officers with a 31% being Ensigns. The one Ensign ACE arrived on board for his first duty tour in the CEC as did three Lieutenant Junior Grade ACEs that were line officer transfers. Of the remaining two ACEs, the Lieutenant Junior Grade was on his second tour of duty in the CEC and the Lieutenant was on his third tour. Both of these officers had served with Naval Construction Battalion Units (Seabees) in their prior tours and none of the six officers had prior public works experience.

PWC San Diego — ACE Public Works Experience

While rank structure in the ACE office at PWC San Diego had increased, the prior public works experience requirement had not been fulfilled in detailing ACE assignments at PWC San Diego. The declining officer strength and unique requirements of independent junior officer billets would have some affect on the detailing of this requirement. However, even through positive credit was given for Naval experience in the use of line transfers to season the increased rank structure, the additional expertise was not in the area of public works facilities management. Based upon PWC San Diego detailing, smaller activities were not receiving total public works management support in the San Diego area as envisioned by the Zero-Base study.

F. STAFF CIVIL ENGINEERS AND PWCs

A major mistake in the past had been to lump the ACE and SCE into one basket as customer representatives at the PWC and talk in combined terms rather than as individual entities. The SCE was "Mr. Outside" in that he spent more than 70% of his time away from the Center. The ACE was "Mr. Inside" in that he spent 60-70% of his time at the Center. The two types of billets may have been doing similar work since they both represented the customer at the PWC, but they approached the task in entirely different ways.

The ACE and other PWC managers recognized the change in ACE and SCE jobs, but not all realized the major changes in

SCE procedures about relationships with the Center. Most ACEs did not seem to recognize the broad scope difference in outputs until they filled a SCE billet.

The SCE was directly detailed on a full time basis to a major Fleet activity being served by a PWC or major public works department (PWD) based upon volume, complexity, and variety of required public works services. He, in effect, filled the function of a public works officer that planned his own facility expenditures, but purchased his operational resources from other sources to carry out plans rather than having his own shop forces. In accordance with OPNAV policy he had total responsibility for all facets of public works matters, the scope of which far exceeded that of the ACE. The SCE had a much larger perspective on facilities, was an integral part of the customer command and had more responsibility in public works matters, especially in the area of facilities planning, developing facilities budgets, financial operating plans, and obligation of customer funds.

The SCE, having a much broader scope of responsibilities and shortage of time available to interact with the Center, was much more willing to let the PWC system operate on its own merits rather than work inside the system as a project monitor. He participated to a greater extent in customer financial planning decisions and acted more as a detached customer buying a service rather than trying to make the services happen.

Major Difference Between ACEs and SCEs

An ACE was much more prone than a SCE to dig into the PWC system, isolate specific work bottlenecks, coordinate problems, push selected jobs throughout the PWC system, and make things happen by whatever method gets the best results.

One PWC commanding officer's comment that illustrated the point was stated as follows:

> "Though customer commands were very receptive to the transfer of billets it was readily recognized by the Center that the SCEs did not interdict the PWC management and work flow pattern as the ACEs did and this method of keeping the center on its toes was sorely missed in the day-to-day PWC operations. Some of this slack has been rectified through the 'ADDU to PWC' process which makes the SCE more receptive to working closer with the Center" [Ref. 12].

The comment not only pointed out the basic differences between SCE and ACE motives, but raised the issue of how commands really saw the role of ACEs in the PWC. This point will be further discussed.

SCEs Increase – ACEs Decrease

An analysis of the current activity billet listing, nine PWC organization charts and the Civil Engineer Corps Directory, NAVFAC P-1, Summer 1972, showed there had been a shift to SCE billets away from ACE billets since June, 1972. In 1972, there were 15 SCE billets served by Centers. By April 1976 there were 44 SCE billets.

Concurrently with the increase in SCE billets, ACE billets were reduced. In June, 1972, there were 54 ACE billets.

By April 1976 there were 36 ACEs assigned to the nine public works centers.

With the decline of public works support at the EFD level, the Zero-Base board recommendation to increase SCEs and decrease ACEs was an alternate method to provide total public works management to larger Fleet activities that qualify for SCE billets. This method worked especially well at stateside Center locations where there could be more than one tour in a single geographic location allowing ACEs to fleet-up into SCE jobs. The more junior SCE generally could transfer from a Center into his new job knowing all the inter-workings of a Center and receive his budgeting and financial operating training in an SCE billet under the guidance of his new staff. The more senior officer assigned to an SCE job usually arrived on scene with prior public works management experience and functioned as a total public works manager at a faster rate than did the newly transferred ACE to the SCE position. This increase in SCEs and decrease in ACEs had enabled NAVFAC to place more CEC officers in the focal point for total facilities management at Naval activities served by PWCs and functioning under the concept of the unilinear Navy.

SCE Improves Value Of CEC Officer

Our research indicated that the ACE to SCE migration had not only improved job satisfaction of junior officers, but had greatly improved the value of CEC officers in the unilinear

Navy. This was borne out by survey responses that indicated strong reliance by Commanding Officers. In most cases, a SCE fully participated in public works problems at all levels of the customer Command. Personal interviews with SCEs on-site in San Diego also verified improvement in customer relationships, and that SCEs were normally looked upon as facilities managers for the activities.

SCE Function In Accordance With OPNAV Policy

The survey data indicated that SCEs were generally functioning and exercising their expertise in facilities matters as total public works managers in accordance with OPNAV Notice 5450, Appendix D.[13]

Overall, the increased SCE concept at areas served by PWCs appeared to be working well and fulfilled the NAVFAC objective to maximize the use of the CEC officer in public works management.

However, an issue remains as to the method to strengthen those smaller activities that are still being served by ACEs, have maintenance funding requirements, and require total public works management.

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[13]OPNAV Note of 16 October 1969 expired for record purposes on 31 December 1969. However, this was the only source we found where CNO officially promulgated functions of Staff Civil Engineers.

G. STAFF CIVIL ENGINEERS — SAN DIEGO AREA

At San Diego, SCEs indicated that all functions listed by OPNAV policy were being carried out by SCE officers. However, we did find exception to these findings at two activities in San Diego. Both of these SCEs were functioning more as ACEs than as SCEs. Both were assistants to civilian facilities department heads, had no line authority within the organizations, and performed only as a liaison with the PWC. These officers spent considerably more time in the Center. San Diego ACEs perceived these officers to be totally involved in public works management since both they and these two SCEs did their work in like ways.

A considerable part of SCE customer liaison at PWC San Diego was conducted between SCE staffs and PWC civilian managers. This liaison was normally with the production control group of the Center on a scheduled basis rather than as random interactions. The San Diego SCE staffs normally got their answers from the production control group and placed more reliance on the PWC system.

San Diego SCEs indicated that they generally spent less time than did the ACEs in the Centers departments, as we shall see later.

San Diego Area — SCE Public Works Experience

To discover the public works experience of SCEs served by PWC San Diego, the PWC Command was asked about detailing. The normal practice was to use former ACEs and, in two cases, a former Senior Ace and Planning Officer.

Seven of nine current SCE billet holders at San Diego, in those activities primarily served by the Center, were analyzed. Two remaining SCEs were at Non-charter activities and thus were not included. Out of seven SCE billets interacting with the Center, four were filled by officers with previous duty with the Center. Two were filled with a Commander and Lieutenant Commander with prior public works experience. One was filled by a Lieutenant Junior Grade officer without prior public works experience. Comparative data from other PWCs were not available at this time.

H. PWC SAN DIEGO — THE CENTER'S PERCEPTION OF AN ACE

The PWC Commanding Officer viewed an ACE as a public works officer and his personal representative at a customer Command, the primary customer representative at PWC, and the primary liaison between PWC and its customers.

The PWC Commanding Officer relied on ACEs to provide feedback to him on any and all matters that related to PWC operations. ACEs were expected to keep abreast of changing support requirements of customer Commands and insure that PWC was advised of them in sufficient time to meet them in a responsive manner. In addition, they were expected to evaluate PWC's performance in the field and to advise the PWC Commanding Officer of their observations good or bad. To do these, ACEs were encouraged by Command to spend more time in the field. The Commanding Officer also relied on ACEs for feedback related to the internal operations of a

PWC. ACEs were encouraged to interject themselves into all levels of the PWC organization and were given the authority to do this. In short, ACEs were the external and internal "eyes and ears" of a PWC Commanding Officer.

PWC San Diego viewed ACEs as customer liaison officers — "insiders" at PWC. PWC personnel relied on ACEs to coordinate matters such as amendments or revisions to funding documents, availability of materials, or field engineering support with other PWC departments and with customer Commands.

In contrast to ACEs, SCEs were viewed as "the customer" which apparently stemmed from the fact that SCEs generally made the decisions about scope of work and funding. They were treated with the deference accorded to "outsiders." They were not involved with routine day-to-day problems about funding documents, material problems and other matters requiring Center coordination. PWC personnel dealt directly with the SCE's staff or assumed the coordination responsibility themselves.

The Senior ACE coordinated the activities of subordinate ACEs guiding them in the performance of their jobs. He was the focal point in a PWC for customer relations and was the chief customer advocate. Because of his lesser military seniority within the PWC, he was assigned a variety of administrative jobs unrelated to his primary responsibilities. Data from other PWCs indicated that these might include rewriting command disaster control plans, acting as area CEC

recruitment coordinator, chairman for major social functions and charity drives, military displays and performances, chairman for large ad-hoc committees, responses to Congressional investigations, reports, and special studies. It is understood that these are functions that all PWCs are required to accomplish. These additional duties limited the time a Senior ACE was able to counsel ACEs on customers' public works management problems and must be recognized. They reduced his effectiveness as a customer advocate by limiting the degree of familiarity he had with their operations and support requirements.

I. PWC SAN DIEGO — CUSTOMER COMMAND'S PERCEPTION OF AN ACE

Customers viewed ACEs as a primary liaison with a PWC and as a PWC expert. They looked to them for advice and information on all facets of facilities management, although they didn't realistically expect ACEs to possess all the information themselves. ACEs provided a familiar and readily accessible communication channel to a PWC.

Commands recognized that an ACE had other responsibilities and was not at their exclusive beck and call. They were hesitant, therefore, to place too many demands on ACEs because they did not know their total workload. Nevertheless, Commands made conscious decisions about how much to rely on ACEs in their facilities problems. They based those decisions on the amount of time an ACE spent at the Command, the interest he showed in his job, and how well he performed

in the job. Customers were hesitant to integrate an ACE into their schemes of facilities management unless he showed he was able to devote the necessary time.

Customer Commands viewed ACEs as valuable adjuncts to their own management capabilities. They were inclined to use an ACE to the maximum extent possible constrained only by his abilities and the time he could devote to them.

Three Commands in San Diego have established facilities management offices. These Commands own plant account and receive funding for the maintenance of real property which approximates $80,000, $200,000 and $350,000.

The offices which were established went beyond the traditional first lieutenant's office staffed with nonrated enlisted personnel assigned to grounds maintenance, pickup of roadside litter, and other labor-intensive housekeeping functions. These offices were management oriented and staffed with civilians. They were involved in short and long range shore facilities planning and all aspects of facilities maintenance financial management. These offices were the primary point of contact and were the customer counterpart of an ACE. The personnel in these offices were in general not experienced with the Navy's numerous facilities management programs. Some, however, were familiar with budgeting and financial operating plans and PWC operations. When compared to a SCE's office, they were smaller in size, lacked experience in facilities management, and lacked engineering expertise.

J. PWC SAN DIEGO — ACE's PERCEPTION OF HIS JOB

ACEs were uncertain as to what responsibilities and functions were encompassed by their assigned roles described by the Commanding Officer as public works officer and his personal representative for customer Commands, and the primary customer representative within PWC. They did not feel they had clear guidance from the PWC Command about their job responsibilities. They were aware of NAVFAC and PWC policy on the functions of the ACE billet, but these did not satisfy their need for clarity. They were concerned that the PWC, as a whole, did not have a complete understanding of the breadth of their jobs and their responsibilities.

Broad descriptive statements did not convey guidance to an inexperienced junior officer who lacked the experience from which to draw their implied meanings. Only after some job experience and interaction with his seniors did the titles take on their intended meanings for an ACE. However, this experience did not always remove all uncertainty. An ACE was told that his job encompasses a broad range of functions, yet he realized that he did not provide support in such matters as shore facilities planning, budget formulation or development of financial operating plans. He recognized that in reality he was a liaison officer who monitored the progress of work through a PWC and tracked down job details.

Some ACEs perceived that the functions of a SCE billet were similar to those of an ACE billet. In fact, they

subjectively judged the performance of a SCE on how closely his day-to-day routine paralleled their own. ACEs were not generally aware of the breadth of SCE responsibilities, and how deeply involved he was in the overall operations of his parent Command. This perception reflected a limited understanding of the full range of facilities management responsibilities of customer Commands.

ACEs' formal training in public works management was obtained at CECOS and consisted of an intensive eight week school introducing him to the world of diverse CEC functions. This course covered the spectrum of CEC functions in the first four weeks and one of three specialty areas in the last four weeks; public works management, contracts administration, and construction battalions (SEABEES).

Officers assigned to PWCs went through the public works management specialty course. This course gave an officer working knowledge of public works management, planning, and operations in the support requirements at Naval facilities and activities. Within the last year, officers designated for ACE billets have received specialized training in some aspects of PWC operations. This subspecialty training consisted of ten hours of separate classroom instruction on Public Works Center functions and services. Prior to this, no effort was made to provide separate information on PWCs.

In the area of budgeting and financial operating plans, the public works management course provided considerable

instruction on the high level aspects of Navy financial budgeting and management. Officers also received minimum instruction, approximately two hours of lecture, on activity level functions in the financial area.

ACEs felt that their brief introduction to the different aspects of facilities management in CECOS was overwhelming at the time. They did not feel they had a grasp of specific programs i.e. budgeting and financial management at the shore Command level.

All ACEs thought that additional staffing was needed in an ACE office to help them process the paper work and perform the more mundane administrative tasks. In addition, they felt the staffing would be of valuable assistance to them in monitoring the progress of their jobs in the PWC system. The staffing would also allow them to spend more time in the field with customer Commands. There was some controversy, however, about the responsibilities that this staffing should be assigned.

A widely held belief among ACEs was that they lack line authority over PWC resources commensurate with their job responsibilities. Since an ACE billet was clearly shown as a staff position this was scarcely surprising. ACEs thought line authority over PWC resources would enable them to perform effectively by controlling, to some degree, when PWC services would be provided to their customers. ACEs felt personally responsible to their customers for PWC's performance,

and felt their customers held them responsible for it although the customers knew ACEs had no formal control over it.

K. PWC SAN DIEGO — OBSERVATION OF ACE FUNCTIONS

A first objective here was to determine what role Activity Civil Engineers have assumed in PWC operations. ACEs at PWC San Diego spent 60-70% of their time, by their own estimates, working internally in PWC functioning as a coordinating agent and central point of contact for their customer's work requirements. This time was consumed by:

(1) Preparing work requests.

(2) Resolving problems arising from jobs in the planning and estimating stages.

(3) Resolving funding problems.

(4) Monitoring and expediting material procurement in support of customer jobs.

(5) Checking the progress of jobs in the PWC work flow process.

(6) Preparing step one submissions for shore facilities special projects.

(7) Maintaining personal desk logs which showed the status of their customers' work requests in the PWC system. The logs also provided a record of oral discussions with customers regarding job information.

(8) In general, functioning as the principal customer representative at PWC.

The largest portion of this time was devoted to specific work requests which involved maintenance work. ACEs got involved in minor work and emergency service requests only when problems arose which affected their customers. They did not normally monitor or keep themselves abreast of the status of these types of work to the same degree as specific work requests. Likewise, ACEs got involved in utilities and transportation matters only as the need arose. In all of these areas -- maintenance, utilities, and transportation -- ACEs were concerned with either problem solving or arranging and coordinating PWC services to be provided to their customers.

The tasks which ACEs performed took them into every work group, branch, division, and department of a PWC organization. Their responsibilities and areas of concern cut across the structure of the organization at every level. They learned the most detailed working procedures of the organization. They became intimately familiar with the formal and the informal organizational structure, and the interrelationships that existed as they traced work requests through the system. They located the sources of power and learned where to go and to whom to talk to get things done for their customers. Few others in the organization had as much inside knowledge.

Activity Civil Engineers at PWC San Diego were functioning as an integral part of the internal management control

of the PWC work flow process. This was evidenced by the continuous monitoring of the scheduled work which they performed. They focused PWC management attention on jobs which were not progressing according to schedule through engineering, planning and estimating, material procurement, or the shops when the field work was accomplished. ACEs could be described as the "customer conscience" of a PWC which must be satisfied.

Today, an ACE spends the majority of his time working internally in a PWC. This precludes him from spending more time with his customers representing PWC and working closely with them to solve their facilities management problems. Predictably, ACEs are intimately familiar with PWC operations and less knowledgable of the varied facilities problems that their customers face.

Functions Performed At Customer Commands

An ACE's remaining available time, approximately 30%, was spent with their customers. There the ACEs were involved in face-to-face liaison with customer personnel, investigated new facilities problems, discussed problems related to the work requirements submitted to PWC, provided feedback on the status of work requests at PWC, and provided facilities management counsel to their customers. In this role, ACEs acted as PWC representatives at the customer Commands.

ACE Functions Proposed By NAVFAC

A comparison of observed ACE functions and those functions proposed by NAVFAC revealed that the following ones

were performed by San Diego ACEs. This finding was corroborated by the survey:

"1. Serve as the principal liaison between the PWC and Customer Activity...

5. Provide guidance and technical advice relative to PWC functions, services, and proper funding procedures.

6. Provide current information to the PWC regarding customer funding plans and predictions...

16. Keep customers advised as to the status of jobs.

17. Coordinate the inspection of completed work and punch list items to insure satisfactory completion of all jobs.

18. Keep Senior Activity Civil Engineer and appropriate customer activity contact advised of command interest jobs and potential problems."[14]

The comparison also revealed that the following NAVFAC proposed functions were not performed by ACEs at San Diego. This finding was corroborated by the survey:

"1. Assist in the formulation and preparation of customer activity public works budgets.

2. Assist the activity in developing and implementing the annual public works financial operating plan...

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[14]These functions are set forth in a proposed NAVFACINST 5450. See Appendix E.

4. Assist in the formulation and preparation of BFRL's, BEM, MCON[15] and special projects."[16]

The nine remaining NAVFAC proposed functions were performed to varying degrees by ACEs at PWC San Diego.

The ACEs non-involvement in the development of customer facilities budgets stemed from; their lack of knowledge in this area, a shortage of time, reluctance on the part of a customer Command to allow an outsider to enter into its decision making process, and the limited budget information developed by PWC for its customers. This budget information for utilities, transportation, and recurring maintenance costs was provided in past years. However, the trend toward earlier and earlier budget submissions by customers had made it more difficult for a PWC to provide the information for consideration by customers. As a consequence of their limited role in the budget process, ACEs did not get involved in the development of financial operating plans either.

The other functional area in which ACEs did not get deeply involved was shore facilities planning. The reasons most often heard were lack of time and training. However, the controlling reason may be that PWCs have a staff of facilities planners that provide this service to customer

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[15]Basic Facilities Requirements List (BFRL), backlog of essential maintenance (BEM) and military construction (MCON).

[16]See Appendix E.

Commands. While an ACE took part as an interested party, the PWC facilities planners were relied upon to have a detailed knowledge of the planning system and its time cycles. ACEs wanted to be involved in planning evolutions beyond providing liaison and consulting services for customers. To broaden an ACEs knowledge of the planning system, PWC San Diego had sponsored ACEs at the formal two-week shore facilities planning course at CECOS. In addition, the Command had encouraged ACEs to involve themselves more in the facilities planning matters of their customer Commands; they have prepared step one forms for activity special project submissions.

ACEs were not functioning as facilities managers as much as they were administrators at PWC of their customers decisions regarding facilities maintenance.

L. ACE JOB SATISFACTION: CEC RETENTION FACTOR OF ACES

Both military and civilian personnel said that the ACE billet was a "turn-off" for junior CEC officers causing an inordinate number of them to leave the Navy at the completion of their minimum service requirement (MSR). An attempt was made to test the validity of these impressions.

Based on data from eight PWCs, a retention factor of 32% was calculated for all officers who had previously served in ACE billets since January 1, 1970.[17] The parameters on which the analysis was based were:

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[17]Retention factor for our purposes is defined to be the percentage of officers still on active duty after completing the initial minimum service requirement (MSR). In this analysis an officer had to have reached the grade of Lieutenant or be attending postgraduate school to be considered a career officer.

1. A current NAVFAC P-1 officer personnel listing was used to determine those officers who were still on active duty.

2. Junior officers now serving in ACE billets were not included in the computation.

3. All officers, except for those in postgraduate school, below the rank of Lieutenant were not included as these officers were assumed to be before the point of MSR.

4. Senior ACEs and limited duty officers (LDO) were not included as they were assumed to be past the point of MSR.

5. SCEs were not included in the listing unless the officer had previously served as an ACE.

6. PWC San Francisco ACEs were not considered since the Center was not commissioned until 1974 and ACEs there would not have completed their MSR.

Data needed for a comprehensive analysis of ACE retention was not available.

Table VII – Overall CEC Retention Data

We were able to compare the 32% retention of ACEs in the CEC with the overall CEC retention factor for Fiscal Years 1969 through 1975 which ranged from 18% to 27% as indicated in Table VII:

TABLE VII

OVERALL CEC RETENTION DATA[18]

	FY 69	FY 70	FY 71	FY 72	FY 73	FY 74	FY 75
Overall Percentage	26%	18%	25%	27%	23%	27%	23%

Based on our comparison, statements that assignment to an ACE billet at PWCs adversely affected junior officer retention more than other types of CEC duty was not substantiated.

Table VIII – ACE Retention Factor in the CEC

ACE retention factors in the CEC for each of the PWCs is shown for the period January 1, 1970, to the present:

TABLE VIII

ACE RETENTION FACTOR IN THE CEC BY PWC SINCE 1 JAN 1970

PWC	NUMBER OFFICERS ASSIGNED ACE BILLETS	NUMBER OFFICERS STILL ACTIVE DUTY	PERCENTAGE RETENTION
Subic Bay	10	6	60%
San Diego	19	10	53%
Yokosuka	14	6	43%
Pearl Harbor	23	8	35%
Great Lakes	12	3	25%
Guam	21	5	24%
Norfolk	19	3	16%
Pensacola	20	3	15%
TOTAL	138	44	32%[19]

[18]Data was provided by CEC detailers office in BUPERS.

[19]This is considered to be the maximum retention factor since it can be anticipated that some of the more junior Lieutenants will leave the Navy in the future.

PWC Subic with a percentage of 60%, was well above average. A contributing factor may be that ACEs in Subic functioned more as SCEs. Subic ACE jobs were supported by activity staffs funded by the customer and reported to the ACEs in a line capacity. The ACE billet was not the same as those at other Centers. All of the ACE billets at PWC Subic, except for the Naval Hospital, became SCE billets in 1973.

Other factors not included in our analysis were the numbers of officers allowed to augment into the regular Navy. Recent years have shown that very few numbers were available to the CEC because of total decreasing Navy officer personnel authorization. This may have lowered retention percentages for some Centers.

VI. DISCUSSION AND CONCLUSIONS

ACE Functions

ACEs are more deeply involved in the internal PWC operations than they are in the public works management problems of customer Commands. Their involvement in PWC internal management can be attributed to several factors. First, ACEs are assigned to a PWC for primary duty. It is their Command, their work group. They, therefore, identify very closely with the organization.

Second, they initially become more familiar with the PWC environment than their customer Commands' environment. They have an office in the PWC; their predecessors introduce them to the people there; and they begin to work closely with them, developing friendships. While some of this will also occur with the customer Commands, it does not happen to the same extent.

Third, ACEs learn their job responsibilities from their predecessors and peers. This perpetuates traditional tasks and functions regardless of their appropriateness. Only later do ACEs begin to tailor their jobs to suit their own modus operandi and personal needs. They, in turn, will transfer these job definitions to their successors.

Fourth, the PWC Commanding Officer encourages ACEs to interject themselves into PWCs organization to acquire the information necessary to monitor the status of their jobs

to satisfy their customers. They are encouraged to seek information at all levels of a PWC to accomplish their coordinative and liaison functions. Information that ACEs acquire, then, can serve as a check and balance on the information that the formal organization provides the Commanding Officer for decision making purposes.

Fifth, since customer Commands hold ACEs accountable for PWC performance, their criticisms of PWC responsiveness have led ACEs to become involved in controlling and scheduling the PWC work flow process. ACEs have done this in an attempt to improve the operating efficiency of a PWC which significantly affects customer satisfaction.

The job, as presently structured, is a valuable educational, training and maturing experience for these junior officers. It provides the opportunity for ACEs to work with other people in the alternating roles of managers and subordinates. Furthermore, the knowledge they gain in many facets of PWC operations provides a solid foundation for their assignment to more senior PWC management positions in later years. Their involvement in PWC operations also leads to identification and correction of weaknesses in production system procedures.

However, the present job definition precludes ACEs from spending more time with their customers on facilities management problems which has some unforseen consequences — "development of customer Commands facilities management offices" —

as we shall see. It also limits the training and experience that ACEs receive in total public works management which results in the suboptimization of the CEC facilities management expertise. Their continuous intervention in the PWC system has a disruptive effect on the flow of work as they attempt to satisfy a customer's parochial interest in its work. What one customer gains, another loses.

The need for effective internal control of PWC operations has long been recognized, but until the advent of PMS II at PWC San Diego, the means for providing such control was limited. PMS II provides significant improvements to the internal PWC management control system and appears to have the potential to free ACEs from their internal control functions. ACEs must be freed from PWC internal control operations to focus their skills on facilities management at their customer Commands.

Public Works Management Support Of Customers

The establishment of facilities management offices reflects the concern of customer Commands about facilities management matters. The reasons for their establishment may be a result of the dwindling public works management support available from EFDs, as well as a lack of this support from PWCs.

It is apparent that PWCs do not provide public works management support to customer Commands which is comparable to that which was provided under public works departments. The management vacuum that is created at the time public

works departments are consolidated into PWCs is not being filled by either EFDs or ACEs. Large Commands are not seriously effected by these consolidations since they retain some in-house management capability in the form of a SCE office. The smaller Commands which hold plant account, however, must rely on either EFDs, or PWCs or themselves for this management support. In San Diego, some appear to have chosen the latter.

The advantages are that a facilities management office centralizes and coordinates maintenance programs so a Command should get more maintenance for its dollars. It should develop historical files for facilities which can prove valuable when evaluating and developing maintenance requirements. Finally, it will provide a Command with resident experience and knowledge of facilities maintenance, providing continuity to its facilities management programs.

The disadvantages are that, initially, personnel in these offices will be inexperienced in facilities management. This may bring some confusion and conflicts that should rectify themselves as experience and knowledge in public works is gained. There will also be a lack of technical expertise.

These offices will become the repositories of facilities management expertise, without benefit of a CEC officer or the collective CEC expertise available through a PWC, furthering the independence of smaller customer Commands in facilities management. As the ACE and PWC roles are currently carried

out, CEC officers are not as close to the decision point for facilities matters as they should be. They will not be until they are more available to these smaller customer Commands.

ACE Requirements

In addition to the lack of time, ACEs do not have the training or experience to provide the facilities management support which is implied by current PWC instructions and the proposed NAVFAC Instruction on ACE functions. The limited training which officers receive in the basic CEC indoctrination course does not prepare them to function independently in public works management programs. A thorough working knowledge of these programs is often gained in a public works department under the tutelage of senior CEC officers and civilians or in a SCE's office working with an experienced civilian staff. An inexperienced ACE should not be expected to perform these tasks for his customer Commands with his limited training and experience.

Additional civilian staffing in an ACE office appears to be warranted to help process the large amount of paper work and to assist in the performance of the more mundane administrative tasks.

The danger of this action is that the staffing may become involved in monitoring work progress in the PWC system. This would be contrary to the new PWC organizational concepts as embodied in the Production Control Office responsibilities.

SUMMARY CONCLUSION

Our research, findings and discussions have led us through the evolution of public works policy, the unforseen consequences of structural change, and the perceptions of PWC, SCE and ACE roles as they are used today by Fleet activities.

We have found that a major percentage of facility engineering requirements in the CEC is public works management oriented and will remain so in the unilinear Navy. This tells us that there is a definite requirement for public works management expertise in the Navy today and as CEC officers, we have a responsibility to recognize this requirement and its implications.

Due to the unilinear Navy concept, NAVFAC and EFD support roles have changed from that of authority and responsibility to implement public works management to that of rendering assistance upon request from major claimants and commands. This change has directly influenced the level of support available from NAVFAC and EFDs to Fleet activities, which now have responded by building their own facilities expertise. Nowhere has this change been greater than at Fleet activities served by PWCs.

NAVFAC was able to forsee this outcome through the Zero-Base study and implemented recommendations to meet the challenge in the form of increasing SCEs and decreasing ACEs. Our findings show that the SCE concept is alive and kicking by providing total public works management expertise to

larger activities and fulfilling the need for CEC expertise at points close to Command decision processes. However, the issue remains as to what public works expertise is being provided to smaller activities that are served by ACEs. PWCs, though capable, are not providing total public works management to activities they serve. This is especially critical at those activities not being served by a SCE.

ACEs are, in fact, receiving conflicting role signals from NAVFAC, PWC, and routinized ACE procedures that lead to frustrations. The consequences of this are that ACEs are in effect providing internal control mechanisms for PWCs and are not being maximized as CEC officers at their assigned activities. Maximization includes training, experience, and use as a public works manager at small activities that have a continuing valid requirement for CEC expertise. The spin-off of maximization to the Corps and the future value to the Navy are not quantifiable.

Perhaps it is sufficient to say that our major CEC image in public works management is obtained at concentrated geographical Naval complexes where large numbers of CEC officers interface with Fleet activities. Since Public Works Centers are located in these critical areas, they are in the forefront and their performance determines how CEC public works expertise is viewed and measured in today's unilinear Navy.

It is our conclusion that PWCs and their ACEs could be better used in providing needed total public works support

to Fleet activities than that being provided under their current roles in the unilinear Navy.

VII. RECOMMENDATIONS

RECOMMENDATION 1: REMOVE ACTIVITY CIVIL ENGINEERS FROM THEIR ROLE IN THE INTERNAL MANAGEMENT CONTROL OF THE PWC WORK FLOW PROCESS.

The requirement for internal control of the PWC system has been recognized as a paramount factor for achieving an efficient production process of public works services. It has substantially been provided in the past by ACEs monitoring the progress of work through the PWC system. When they are removed from this role, one of the other PWC divisions will have to assume their responsibilities.

At San Diego, the Production Control Office and PMS II appear to have the potential to do this. Other PWCs will have to perform the necessary internal control functions using alternative means until PWC-wide implementation of PMS II is achieved. A feasible alternative is the existing Public Works Centers Management System (PWCMS) incorporating the 3Z06 customer job status report.

RECOMMENDATION 2: REDIRECT THE FUNCTIONS OF ACES TO FACILITIES MANAGEMENT MATTERS OF CUSTOMER COMMANDS.

This recommendation rests upon four factors; a change in Command policy, the availability of time, additional training for ACEs, and an increased level of experienced support from senior ACEs.

Changes in policy will be addressed in a subsequent recommendation. The time needed to accomplish these new responsibilities should be a result of the successful implementation of Recommendation #1. Training and support from senior ACEs will be discussed in subsequent recommendations.

RECOMMENDATION 3: REVISE PROPOSED NAVFAC INSTRUCTION 5450 TO DIRECT ACES TOWARDS IMPROVED CUSTOMER FACILITIES MANAGEMENT SUPPORT.

To change past ACE preceptions and routinized procedures, NAVFAC policy guidance will be required to redirect command emphasis toward better use of ACEs in facilities management at customer levels rather than used internally for PWC control purposes. In effect, we are saying that ACEs should be encouraged to be more of a SCE to his customers than they are in the current ACE role.

Specifically, NAVFAC proposed functional statements 13, 15, 16 and 17 encourage ACEs to become involved in internal PWC operations. It is not our intention to say that ACEs should never become involved internally as there are obviously times that such involvement will become necessary. However, it is important that policy be provided, be it NAVFAC or PWC command, emphasizing long range customer and PWC benefits and involving ACEs more in their customers' management of public works matters than has been done in the past.

It is our contention that in order for this to happen there must be a policy revision. This can be implemented through the policy statement in the proposed instruction.

RECOMMENDATION 4: REEMPHASIZE SENIOR ACTIVITY CIVIL ENGINEERS' BILLET TO BE ONE OF PRIMARY SUPPORT FOR ACES AND PRINCIPAL CUSTOMER COMMAND ADVOCATE WITHIN PWC.

Senior ACEs will have to provide a higher level of support for ACEs in the field in all areas of public works management than they do today. This will be required to compensate for the limited training and experience ACEs have in public works management programs. This increased level of support should be a major factor of consideration by CEC detailers in providing maximum support to Fleet activities. This also necessitates that Senior ACEs will have to have prior experience in public works either as Public Works Officer, Assistant Public Works Officer, or Staff Civil Engineer. The confidence and experience gained in those billets will enable them to provide detailed guidance and training of ACEs as well as bring the customers' viewpoint of public works management to PWCs' policy making bodies.

RECOMMENDATION 5: BROADEN TRAINING IN FACILITIES MANAGEMENT PROGRAMS FOR THESE OFFICERS TO BE ASSIGNED TO ACE BILLETS DURING THE BASIC CEC INDOCTRINATION COURSE AT CECOS.

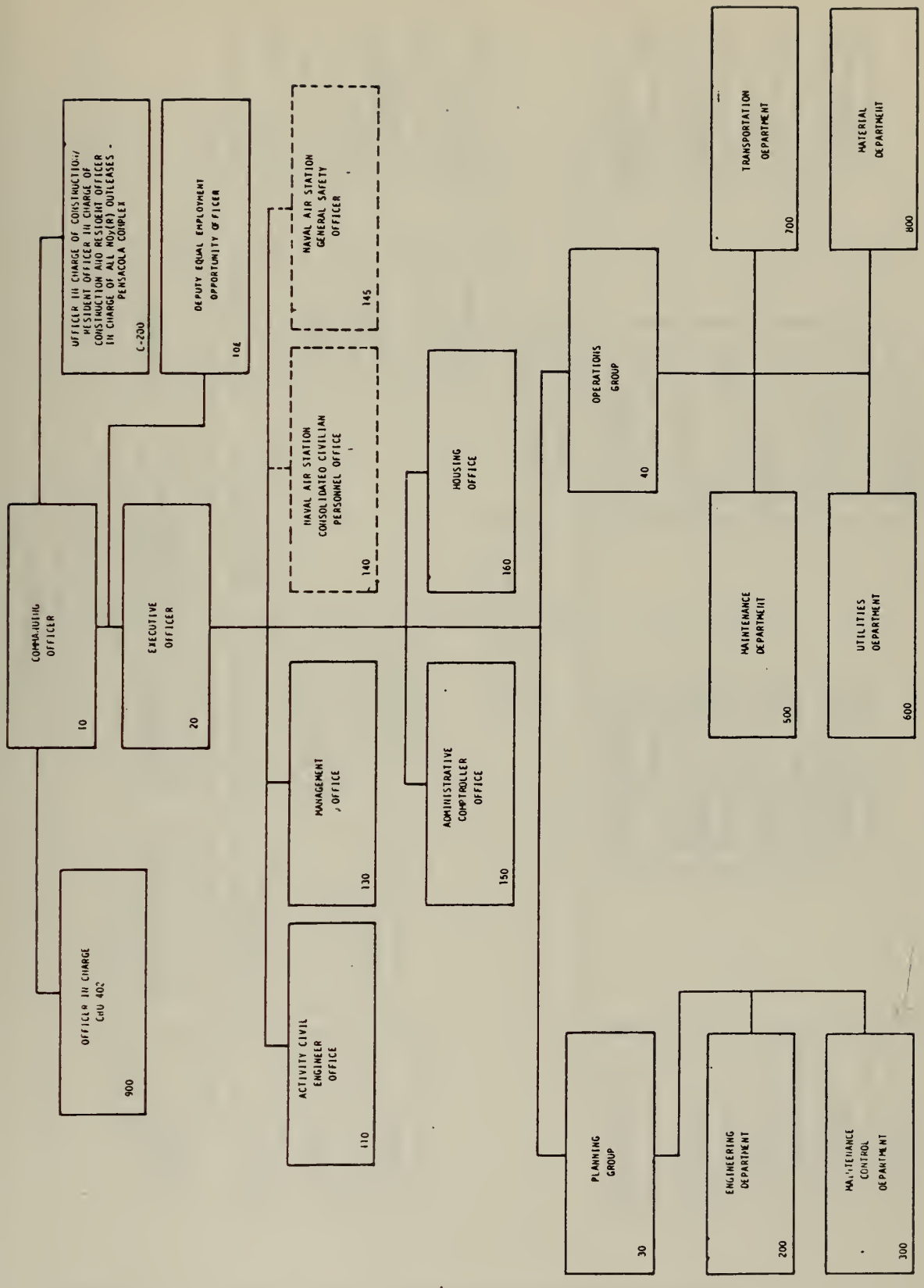
To perform in their new role as customer Command facilities managers, ACEs will have to have more thorough training in matters of O&MN budgeting at the activity level, development of facilities maintenance financial operating plans, and shore facilities planning. It would be desirable to accomplish this as part of the basic indoctrination course at CECOS.

RECOMMENDATION 6: PROVIDE ADDITIONAL CLERICAL STAFFING WHERE REQUIRED FOR ACE OFFICES TO ASSIST ACES IN HANDLING THE ADMINISTRATIVE WORKLOAD.

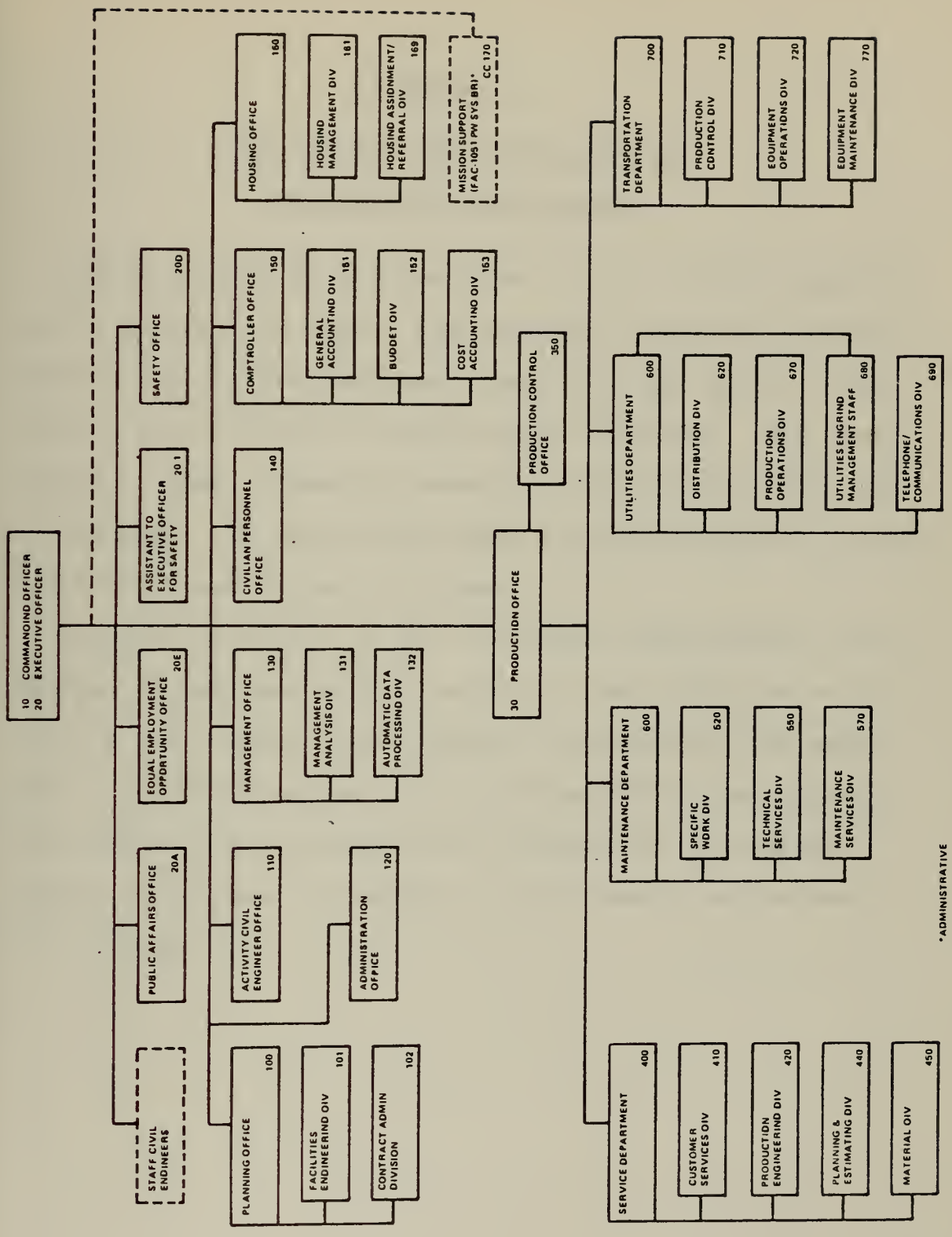
This staffing would be required to provide routine administrative support for the ACEs who will be spending most of their time at customer Commands. It is recognized that some PWCs may already have sufficient clerical support and each PWC will have to make its own judgment.

RECOMMENDATION 7: CONDUCT ADDITIONAL RESEARCH TO DEFINE ORGANIZATIONAL CHANGES AND IMPLEMENTATION PLANS REQUIRED TO REDIRECT ACES TO FACILITIES MANAGEMENT MATTERS OF CUSTOMER COMMANDS.

It is recognized that plans for implementation of the recommended changes would vary from one Public Works Center to the next due to a myriad of factors. These plans have not been addressed because of their broad nature and the limited time available for this research.



APPENDIX A — TYPICAL PWC ORGANIZATION CHART



APPENDIX B — PWC SAN DIEGO ORGANIZATION CHART

APPENDIX C

ACE AND SCE COMPOSITE ANSWERS FOR ACE/SCE QUESTIONNAIRE

After receipt of the responses to the ACE/SCE Questionnaire, a composite answer was developed for each question. Answers are divided into two categories; ACE and SCE, and reflect major points of those answers provided. The development of these composite answers required interpretation on our part. We acknowledge that a certain amount of filtering takes place in such a process.

Answers to Part I of our three-part Questionnaire were deleted as were senior ACE replies. Even though we experienced a 48% response, the response was from all PWC areas and is a wide cross-section of ACE and SCE billet holders. The questions and answers were analyzed for significant trends, which were reflected in our research and write-up of findings.

INTRODUCTION

BACKGROUND

Both of us have worked in Public Works Centers. Don was Planning Officer at PWC Subic Bay for three years; Bob was an ACE at PWC San Diego for one and a half years, Senior ACE at PWC Subic Bay for four months and Staff Civil Engineer at NAS, Barbers Point for one and a half years.

This survey is being sent to all incumbent ACEs and SCEs at all public works centers as well as some of the junior officers who held these billets in the past. Your replies will provide a benchmark to use in a detailed study of the ACE/SCE billets.

Your identity as a respondent is not desired; the information you provide will not be traceable back to you. We have requested and received the approval of all PWC COs to conduct this survey of their officers.

SURVEY INFORMATION AND INSTRUCTIONS

We want to emphasize that the value of the survey depends on your own personal opinions and perceptions. Each question here should be interpreted as it applies to you and your job. This is very important.

For Activity Civil Engineers, we realize that ACEs represent more than one customer and thus your responses may vary depending on to which customer you relate the question. We need your response as it applies to your customers in general.

For Staff Civil Engineers, we realize that you are the customer and are a part of the customer command.

For Senior ACEs, we realize that not all of the questions are pertinent to your billet. Please use your own discretion in selecting questions applicable to your mob.

The survey has three parts: (1) general information, (2) what an ACE/SCE does and (3) what an ACE/SCE thinks they should do. You will quickly recognize that the individual questions in the latter part generally correspond with questions in the second part. This should help you in interpreting the questions.

We have also included certain subtopics which indicate some of our thoughts as we formulated the basic questions. Feel free to address these subtopics and any others which you think are involved in a question. We have tried not to direct your answers; but rather we have tried to give them very general guidance.

Space has been provided in the survey form for your answers. If additional space is required, just attach extra answer sheets to the survey.

Again, thank you for letting us impose upon your time.

GENERAL QUESTIONS

1. Circle the position you now hold (or have held in the past) which you are using as a frame of reference in answering the questions. Indicate the length of time in the position.

   a. ACE SCE SENIOR ACE

   b. Length of time. _____ months.

2. List the range of funds provided annually to PWC by your customers. $ _____ (lowest) to $ _____ (highest).

3. How many PWC customers do you represent? Differentiate between major commands ($100,000 or more of annual work) and minor commands.

   a. Number of major commands _____.

   b. Number of minor commands _____.

4. What PWC or CECOS training have you had before filling ACE/SCE/SENIOR ACE billet?

5. List commands to which you have additional duty orders.

6. Where is the location of your office in relation to the Center?

   a. Integration in building with other PWC departments such as administration or shops.

   b. Separate building with PWC.

   c. Integrated within customer command.

7. Which office location do you prefer? Please explain.

8. List direct support provided to ACE/SCE office by PWC or customer. Please indicate numbers of personnel.

a. Secretaries _____
b. Clerks _____
c. Inspectors _____
d. Engineers _____
e. Other _____

WHAT YOU ARE DOING NOW

1. Describe your normal working relationship with your major commands with regard to:

a. Your importance in customer's activity;

b. Your credibility with customer;

c. Your access to personnel and information in customer's organization;

d. Your participation in customer's decisions;

e. Your relationship with customer's counterpart;

f. Other.

A. ACE Reply: In general, ACE enjoys good relationship with customer, but has limited decision making authority in customer command.

B. SCE Reply: Essential, important, excellent — (credibility was noted as being less than desired by a few).

2. What specific functions and services do you perform for your customers? (Budgeting, transportation management, contracts, facilities planning, inspection etc.)

a. Within PWC.

b. Within customer activity.

A. ACE Reply: Very few involved in budgeting. Most function as job expediters within PWC providing reports on status of work to customers. Some involved in facilities planning and contract work.

B. SCE Reply: Typical PWO functions at customer command. A few had functions within PWC.

3. What authority do you have to expend customers' funds? What are the limits?

A. ACE Reply: Most had no authority. Some had authority for emergency/service work (less than $250.00).

B. SCE Reply: Independent authority up to CO's authority. A few were under authority of department head.

4. What are the expectations of the customer CO regarding the ACE/SCE role from your viewpoint?

a. Project manager
b. Flunky
c. Messenger
d. Customer representative within PWC
e. Activity public works officer
f. Other

A. ACE Reply: Project manager, customer representative within PWC, and activity public works officer.

B. SCE Reply: Project manager, activity PWO and customer representative.

5. Describe the importance which the customer CO states your role plays in the accomplishment of customer requirements.

A. ACE Reply: Answers range from vital to minimum role to no importance at all.

B. SCE Reply:

6. What is your interpretation of the customer CO's actions related to the importance of your ACE/SCE role?

A. ACE Reply: Question was not answered in many cases or difficulty in answering was indicated. Answers that were provided ranged from important to none at all.

B. SCE Reply: Important member of command, essential, respects SCE and advice.

7. What do you think the PWC CO expects you to do in your role as ACE/SCE?

a. Project manager
b. Flunky
c. Messenger
d. Customer representative within PWC
e. CO PWC personal representative at customer activity
f. Activity public works officer
g. Other

A. ACE Reply: Customer representative, CO PWC representative, activity PWO and project manager.

B. SCE Reply: Customer representative, activity PWO, project manager, a few responded negatively regarding the CO PWC — SCE relationship.

8. Describe the importance which the CO PWC states your role plays in the accomplishment of PWC business.

A. ACE Reply: Role is important, it is primary point of contact between PWC and customer, sell PWC product, no importance at all.

B. SCE Reply: Most stated it was important and essential. Few stated they felt CO PWC over-emphasized PWC/CEC connection.

9. What is your interpretation of the PWC CO's actions related to the importance of your ACE/SCE role.

A. ACE Reply: In general actions supported statements.

B. SCE Reply: Half were very positive and half were very negative.

10. How does the personal liaison between the customer CO and CO PWC affect your performance?

a. Extent of influence on your performance.

b. Advantageous or disadvantageous effect.

c. Any communication problems.

A. ACE Reply: Most indicated no problems or it was advantageous. Few indicated it complicated their jobs.

B. SCE Reply: Most indicated advantageous. Few noted poor relationships and communications between CO's.

11. Describe your working relationship with PWC supervisors and managers.

a. Do you have any line authority or only staff authority or combination of two.

b. Degree of use of formal organizational relationships.

c. Degree of use of informal working relationships.

d. Degree of support received from PWC managers.

e. Do PWC Civilian personnel treat you as key players.

A. ACE Reply: Most have staff authority and use informal relationships. Some indicated excellent.

B. SCE Reply: Staff authority, more informal than formal. Responses were random. Most felt they were key player.

12. What are the major obstacles you have encountered in the performance of your job as ACE/SCE.

a. Organization of PWC.

b. Your lack of authority in customer/PWC organizations.

c. Responsibilities undefined.

d. Degree of control over PWC resources.

e. Training/experience.

f. Management information system.

g. Other.

A. ACE Reply: Lack of authority in PWC organization, degree of control over PWC resources, and inadequate management information system (MIS).

B. SCE Reply: Organization of PWC, lack of authority within PWC, degree of control of PWC resources, poor MIS.

13. In view of your success as an ACE/SCE, how have you overcome any major obstacles?

a. Formal/informal relationships.

b. Your knowledge of PWC management system.

c. Exercise of chain of command.

d. Other.

A. ACE Reply: Most use informal and formal relationship. Some relied upon their knowledge of management information system.

B. SCE Reply: Informal relationships, knowledge of PWC MIS.

14. Do you receive adequate departmental support from PWC in doing your job with respect to the following:

a. Timely response

b. Cooperation

c. Adequacy of mangement information system.

A. ACE Reply: Timely response ranges from poor to good, cooperation is good or fair, MIS is untimely or inadequate.

B. SCE Reply: Cooperation good, response fair to good, MIS not helpful and untimely or poor.

15. What support do you receive from your major customers in the following areas:

a. Personnel staffing

b. Office space

c. Budgeting, facilities planning, transportation management etc.

A. ACE Reply: ACEs receive minimal support.

B. SCE Reply: All support is received from customer command.

16. Describe the current role of the Senior ACE in your PWC?

a. ACE/SCE coordinator.

b. Customer representative "Czar".

c. Interpretation of command policy.

d. Supporting role for ACE/SCE.

e. Catalyst in management information system.

f. Other.

A. ACE Reply: Coordinator, interpreter of PWC policy, supporting role to ACE.

B. SCE Reply: Coordinator, interpretor for ACE/SCE. A few commented on little or no role that Senior ACE plays.

17. How do you resolve any conflicts that arise from your dual obligation to both customers and to PWC?

A. ACE Reply: Use good judgment, common sense, and objective evaluation of conflict. A few indicated customer is always right or PWC writes the fitness report.

B. SCE Reply: Customer favored although good judgment is also used.

WHAT YOU THINK YOU SHOULD DO

1. What do you think the customer – ACE/SCE relationship should be?

A. ACE Reply: Most feel ACE should be primary liaison between customer and PWC. They desire close and trusted relationship and want to be involved in customers facilities problems.

B. SCE Reply: SCE act as PWO, better feedback between SCE and PWC, work for the customer, SCE is a full partner in customer command.

2. What changes would you recommend, if any, to improve ACE/SCE relationships with PWC Managers?

A. ACE Reply: Some desire more control for ACE. Some think more coordination is required between PWC managers and ACE improve communication in the system.

B. SCE Reply: SCE should have authority in PWC. SCE should be equal to PWC department heads. A few didn't like ADDU to PWC.

3. What role should ACE/SCE take in PWC business?

   a. What functions should be performed for customers.

   b. What should be customer expectations regarding ACE/SCE role.

   c. What should PWC expectations be regarding ACE/SCE role.

A. ACE Reply: Some desire more duties as PWO, want to be primary contact between PWC and customer, less day to day job expediting, more management responsibility and line authority.

B. SCE Reply: Advocate of customer within PWC, consultant, trouble shooter on jobs. SCE should be PWO and not errand boy and telephone chit chaser.

4. What changes would you recommend to eliminate major obstacles to doing your job?

A. ACE Reply: Improve MIS, more control/authority within PWC, satellite shop at customer activities.

B. SCE Reply: SCE should work for PWC CO, need line authority over PWC resources, better communications.

5. What changes, if any, should be made in the ACE/SCE office about direct personnel support?

A. ACE Reply: Few ACEs reduced to this. Those that did wanted larger staff support in ACE office.

B. SCE Reply: ACEs need more support. Some wanted PWC to push for larger staffs at customer activity.

6. What should be the role of a Senior ACE in the PWC?

A. ACE Reply: Coordinator and supervisor of ACE but there were mixed opinions about how much authority he should have over ACEs. Some felt he should have more control over priorities, but let ACEs run the show.

B. SCE Reply: Primary focal point for customer needs, should have line authority.

7. What training or prior experience should an ACE/SCE have?

A. ACE Reply: CECOS PWC training and management, NIF training, prior PW experience.

B. SCE Reply: CECOS training, ACE experience. Facilities planning course, SCE should have prior P.W. experience or TAD to PWC before going to SCE job.

8. Describe the similarities and the differences you see between ACE and SCE billets.

A. ACE Reply: SCEs are equivalent to PWOs; ACE is a work expeditor. Some didn't see much difference between ACE and SCE billet except for larger SCE staff. Others felt SCE job was more worthwhile.

B. SCE Reply: Very similar to above.

APPENDIX D

OPNAV NOTICE 5450 OF 16 OCT 1969

From: Chief of Naval Operations
To: Distribution List

Subj: Staff Civil Engineer/Activity Civil Engineer Functional Statements and Assignment Policies in Complexes served by Public Works Centers

Ref: (a) OPNAVINST 5310.5A of 30 Apr 1965, Staffing Criteria Manual for Activities Ashore
(b) OPNAVINST 1000.16A of 5 Feb 1969

Encl: (1) Staff Civil Engineer/Activity Civil Engineer Functional Statements
(2) Assignment Guidance

1. Purpose. To issue policy concerning the assignment of functions to Staff Civil Engineers (SCEs)/Activity Civil Engineers (ACEs).

2. Scope. Provisions of this Notice are applicable to shore (field) activities (which obtain public works services from PWCs) and to Public Works Centers (PWCs).

3. Information. Staff Civil Engineers are Civil Engineer Corps (CEC) officers who perform those Public Works Officer's functions listed in enclosure (1). As SCEs they are attached directly to shore (field) activities which receive public works support from PWCs when the volume and/or complexity of the support justifies full-time assignment of a qualified CEC officer for this purpose. Activity Civil Engineers are CEC officers attached to PWCs and designated by the PWC to perform the Center functions listed in enclosure (1) for supported activities.

4. Policy. Staff Civil Engineers shall be attached directly to shore (ifeld) activities in all instances where full-time efforts of a qualified CEC officer are necessary to administer the volume and/or complexity of public works support required. If a shore activity is not entitled to a SCE, the Center will designate an officer to perform the SCE functions for that activity on a part-time basis. Under these circumstances, the officer of the PWC will normally be assigned additional duty to the supported activity for the performance of SCE functions since the bulk of the services provided will come

directly from established organizational entities within the PWC, i.e., Maintenance Control, Comptroller, Engineering, etc. Enclosure (2) provides guidance on assignment policies.

5. Staff Civil Engineer Billet Requests. Shore (field) activities with a sufficient public works workload to justify the assignment of a Staff Civil Engineer, may submit manpower authorization change requests for the establishment of SCE billets. Since no additional billets or upgrades are available, requests for SCE billets are to be submitted via the Naval Facility Engineering Command for review, evaluation and recommendations concerning the availability of compensatory billets.

6. Action.

a. Pending revision of reference (a), Public Works Centers and PWC supported activities will utilize enclosures (1) and (2) as criteria in determining requirements for Staff Civil Engineer and Activity Civil Engineer.

b. Shore activities affected by the above policy will submit requests for changes to the manpower authorization (OPNAV 1000/2) as required, in accordance with reference (b) and paragraph 5 above.

7. Cancellation. This Notice is cancelled when the above action is accomplished and for record purposes 31 December 1969.

L. G. Bernard
By direction

ASSIGNMENT GUIDANCE

Shore Activity Billets – Staff Civil Engineers

Basic criteria for the assignment of a Staff Civil Engineer is that the public works workload is sufficient to require the assignment of a qualified CEC officer. Factors used in determining the rank of the billet are as follows:

1	CDR/LCDR	Each activity with annual public works expenditure greater than $3,000,000.
1	LT	Each activity with annual public works expenditure $1,000,000 – $3,000,000.

Public Works Center Billets – Activity Civil Engineers

1	LCDR	Senior ACE.
1	LT	Up to 3 activities; each with annual public works expenditure $500,000 – $1,000,000 or several with less than $500,000.
1	LTJG/ENS	Several activities; each activity with annual public works expenditure less than $500,000 or with a full-time SCE.

General Comments

1. The above criteria are considered guides only and it must be recognized that special conditions may result in modified requirements. For example, expenditures at certain overseas activities should be adjusted to compensate for area wage differentials.

2. It is anticipated that any requirement for more than one full-time person will be met through use of a combination of CEC officer and civil service personnel with no more than one CEC officer attached as SCE to any one supported activity.

ACTIVITY CIVIL ENGINEERS/STAFF CIVIL ENGINEERS FUNCTIONAL STATEMENTS

Staff Civil Engineers perform public works functions which are considered a direct responsibility of the shore (field) activity. These functions include but are not limited to:

1. Formulate the annual facilities management budget with the activity comptrollers.

2. Develop annual public works financial plan for Commanding Office's approval.

3. Assist the activity comptroller with control of expenditures and review of fund status for adequacy in conformity with operating plan.

4. Coordinate, review, and approve the activity requests for public works services and assign the activity's priorities therefor.

5. Coordinate future expected work with PWC planning organizations.

6. Provide guidance and direction for station master planning and preparation of LSR, BFRL, MCON, and Special Projects submissions.

7. Act as command representative in inspection of PWC/OICC work in congress and for acceptance upon completion.

8. Plan, coordinate, and direct the work of civilian staff made available to assist in the above function.

9. Routinely inspect facilities and initiate appropriate action.

Activity Civil Engineers perform functions which are considered a direct responsibility of the PWC as they relate to support of any particular activity for which an ACE has been assigned cognizance. These functions include but are not limited to:

1. Receive and review customer work requests.

2. Recommend performance method and schedule of performance.

3. Coordinate between customer and PWC shop to insure satisfactory completion of work.

4. Insure PWC receives customer workload predictions as far in advance as possible.

5. Participate in work scheduling within the PWC.

6. Coordinate contractor and PWC work effort.

7. Participate in planning and validation of the annual facilities inspection program and maintain facilities maintenance backlog by customer.

8. Assist the SCE in performance of his functions.

9. Provide technical advice relative to public works functions; recommend solutions to customer problems concerning construction, alteration, equipment installation, maintenance, and repair; provide preliminary cost estimates; and assist in the preparation of facilities projects.

ENCLOSURE (1)

APPENDIX E

PROPOSED NAVFAC INSTRUCTION 5450 FAC 105

From: Commander, Naval Facilities Engineering Command

Subj: Public Works Center/Activity Civil Engineer Functional Statements

Encl: (1) Activity Civil Engineer Functional Statements

1. Purpose. To issue functional statements for Public Works Centers (PWCs) Activity Civil Engineers (ACEs).

2. Scope. This Instruction applies to PWCs. The functional statements are also recommended for adaptation by activities having Staff Civil Engineers (SCEs) assigned and by Activity Liaison Officers (ALOs) at Public Works Lead Activities (PWLAs).

3. Policy. SCEs shall be attached directly to activities with additional duty orders to the PWC or PWLA, in all instances where full-time efforts of a qualified Civil Engineer Corp (CEC) Officer are necessary to administer the volume, variety and/or complexity of public works support required. If a shore (field) activity is not assigned an SCE, the Center will designate an officer or civilian engineer/technician to assist in the performance of those functions on a part-time basis. Under these circumstances, the officer of the PWC may be assigned additional duty to the supported activity for the performance of facility management functions. ACEs should also be assigned to service the parent PWC.

4. Action. PWCs will utilize enclosure (1) as criteria in the assignment of functions to ACEs. Commanding Officers of PWCs will recommend to customer commands with SCEs adaptation of enclosure (1) for the SCEs.

Activity Civil Engineers Functional Statements

Activity Civil Engineers perform the facility management functions which are the direct responsibility of the shore (field) activity to which they are assigned to. These include, but are not limited to:

1. Serve as the principal liaison between the PWC and customer activity.

2. Assist in the formulation and preparation of the customer activity public works budget.

3. Assist the activity in developing and implementing the annual public works financial operating plan.

4. Assist in the formulation and preparation of BFRL's, BEM, MCON, and special projects.

5. Provide guidance and technical advice relative to PWC functions, services, and proper funding procedures.

6. Provide current information to the PWC regarding customer funding plans and predictions.

7. Provide angineering/technical assistance, including review of engineering drawings, specifications, job orders, change orders, etc.

8. Assist activities in regulating work flow into the Center to minimize excessive fluctuations.

9. Provide "customer engineering", and planning estimates to facilitate authorization and funding decisions.

10. Review funding status periodically to assure adequacy and conformity with financial operating plans and to foresee potential overruns.

11. Monitor MCON and special projects.

12. Receive and review activity work requests and assist in establishing realistic job priorities and schedules.

13. Assist in the coordination of customer support services within the Center's planning and operating groups for inspection, engineering, maintenance, utilities and transportation.

14. Assist customer activities in the review of management reports.

15. Monitor all customer activity jobs, including those performed by contract.

16. Keep customers advised as to the status of jobs.

17. Coordinate the inspection of completed work and punch list items to insure satisfactory completion of all jobs.

18. Keep Senior Activity Civil Engineer and appropriate customer activity contact advised of command interest jobs and potential problems.

Enclosure (1)

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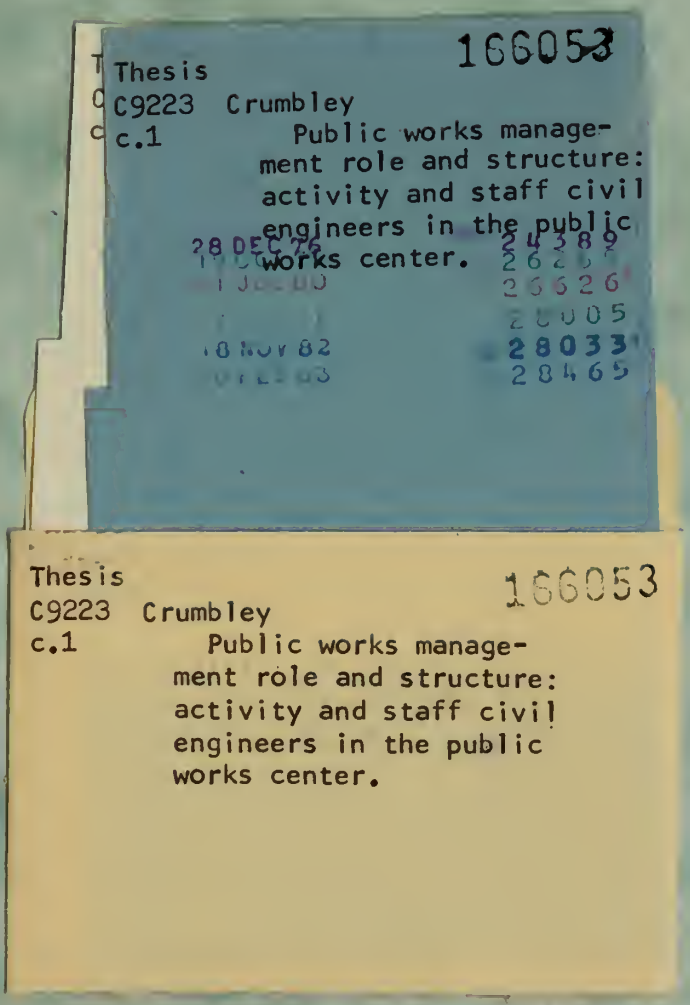

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